THE

AMERICAN JOURNAL

OF THE MEDICAL SCIENCES.

SEPTEMBER, 1890.

A CASE OF BRAIN TUMOR (ANGIOMA CAVERNOSUM), CAUSING SPASTIC PARALYSIS AND ATTACKS OF TONIC SPASMS. OPERATION.

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The following case is one that has been described as atypical myotonia, non-congenital, by Dr. A. B. Shaw, and as neuro-myotonia by Dr. Ch. Hughes, in the *Alienist and Neurologist*, January, 1890.

The patient was exhibited, and the disease discussed at length in the St. Louis Medical Society in the month of November, 1889. The opinions expressed on this occasion as to the nature of the trouble were widely divergent.

The patient was an inmate of the Poor-house, and was, for the purpose of more convenient and exhaustive study, removed to the St. Louis Polyclinic building, where I, with quite a number of medical gentlemen, saw and observed him for several weeks.

The following represents in substance my remarks at a meeting of the Medico-Chirurgical Society held February 18, 1890. The patient was present on that occasion.

Joseph McE. is about twenty-three years old, and was, up to three years ago, in good health. Inquiries as to heredity, syphilis, plumbism, etc., give a negative result.

The history of the case he relates in a uniform manner, and without any material contradictions, as follows: About three years ago, while

working in a mining mill, and feeling perfectly well, he was suddenly seized with a spasm in the left arm, which was drawn across the breast and upward, so that the clinched hand was resting on the clavicle. His arm was "locked" so that he could not remove a pipe which he was smoking at the time from his mouth. At the same time, he avers, there was a slow movement of the head from side to side. (In regard to any implication of the facial muscles his testimony is unreliable.) He felt "miserable all over" at the time, but at the end of a few minutes the spasm relaxed, and he continued to work as if nothing had happened. The same occurrence took place five hours later, while at breakfast. From this day on he had two spasms every day for about a year, when they increased in frequency.

For six weeks after the inception of the trouble he continued to work, being interrupted only when the spasms came on. At the end of this time the toes of his left foot "turned down" so that his walk became interfered with. There was now a weakness in the left foot; he began to limp; but, although the toes pointed downward, he was still able, as he claims, to walk on the soles of his feet. When the foot was first involved his speech became affected, he could not speak as fluently as formerly, and stuttered. At the same time jerks in various parts of the body supervened. They were so violent at times that on various occasions he came near being thrown from the chair. At the time the spastic flexion took place in the toes of his left foot his head was drawn to the left side, and became fixed in this position. He could not move it to the right for two months, and whenever he wanted to look at an object to the right, which was not within his visual field, he had to turn his whole body on its axis, like a person with wry-neck.

Even while in this condition he was still able to do odd jobs about the house—chop wood, for instance. But it would happen to him that, after having raised the axe preparatory to bringing it down on an object with force and quickness, he was prevented from doing so. His arms remained stiff and immovable, with the handle of the axe clutched with the hands in the raised position, for half a minute or so.

Subsequently, at a time which he cannot fix accurately, but at any rate several months after the involvement of the left foot, the right one became implicated, its toes likewise turning down. But the left leg and foot were then, and ever afterward, the weaker of the two. In fact, his whole left side was weakened, besides being spastic.

With all this his general health continued good, his appetite and all the functions of the body remaining in a normal condition, with the exception of his stomach. Although he digested well, he vomited every morning from the onset of the trouble for three months. In the last two and a half years these vomiting spells have lessened in frequency; they came on about twice a week, and were independent of the character of the food he ate; nor were they accompanied by other symptoms of intestinal disturbance.

Having become absolutely unfit for work he came to St. Louis to seek medical aid at the Mullanphy Hospital. Failing in this he went to Philadelphia, where he was under observation and treatment in the Philadelphia Hospital, under Dr. Charles K. Mills. It seems that he left that place suddenly, after a short stay, for the West, entered again the St. Louis Mullanphy Hospital, and finally landed at the Poor-house of this city. This was sometime in the summer of 1889. His case had

remained stationary, but in August, 1889, while at the Poor-house, the weather being extremely hot, he had an attack of great prostration, accompanied with persistent sleeplessness, nervousness, and increased spasms. These latter, whilst they were followed before by intermissions of about five minutes' duration when at their worst, now succeeded each other constantly, so that it was impossible for him to eat. Obstinate vomiting, and pains in the limbs brought about by the intense and uninterrupted contractions of the muscles, added greatly to his sufferings. After a week or so the attack passed off, and he was pretty much in the same condition he was in before, except that from this time on a new symptom developed, which consisted in periodical diarrhœa. His bowels became loose about once a week, and oftener whenever he underwent any unusual amount of bodily exertion.

The present state of the patient (three years after the inception of the disease) is as follows:

He is right-handed, five feet seven and a half inches in height, muscles well developed, general nutrition good. His speech is peculiar; there is no obvious flaw in phonation or articulation; no dropping of consonants, or syllables, or whole words; when he does speak he speaks perfectly, but hurriedly. But before he can begin a sentence it seems as if there were an obstacle to be overcome; this having been accomplished, he speaks rapidly, as if to make up for the time lost in overcoming the obstruction to utterance. There is never any hesitancy in pronouncing *yes*, *no*, or *well*. The latter he is fond of using as a starter, a preparatory exercise for limbering up the muscles engaged in articulating the more difficult letters and words. He repeats it with increasing rapidity a great many times (I have counted as many as twelve times), interposing the letter "a" after this fashion: well-a, well-a, well-a, well-a, etc. The great stumbling-block in beginning a sentence is S, or sh. The difficulty becomes sometimes insurmountable, so that he has to give up all attempts at conveying his thought. He then, in quite a natural tone of voice, will excuse himself, saying: "Well, I can't say what I want to say." In this connection he pronounces the two "S" that occur in this sentence without any difficulty.

But in regard to this difficulty, and for that matter all the other symptoms presently to be described, he has his bad and good days. On the latter his answers are prompt, without any halt or interruption. Thus it happened that, when I undertook to exhibit the peculiarity of the patient's speech to Dr. S. Weir Mitchell, during a recent visit to St. Louis, I utterly failed, the patient answering all the questions put to him in the most natural and fluent manner possible.

In general he is slow to answer questions, a fact which gives the impression of mental hebetude. Whether there is any real impairment of the mental faculties is very hard to determine, since there is no relative or acquaintance who could compare his present mental state with the one before his ailment set in. A noteworthy feature in his mental condition is that he never begins a conversation; he lacks initiative; and it seems that an impetus from without is necessary to rouse him sufficiently to engage in conversation. He claims that this was always the case with him, that, as long as he can remember, he has been "a person of few words." On the whole it may be stated that, in spite of his grave affec-

tion, which for the last three years has so disabled him, that he has had to seek refuge in the Poor-house, he is not to any great extent depressed; there is, on the contrary, an element of optimism observable in his mental make-up. Though his answers to questions put to him are tardy, they are always to the point, and no flaw in his reasoning powers can be discovered. How much of his taciturnity is attributable to the disturbance of speech, and how much of a suspicion as to his mental condition is due to the weird appearance which his face and body present in consequence of often-repeated slow tonic contractions in the face, neck, and limbs, is hard to determine. Among his fellow-patients he passes as absolutely level-headed.

There seems to be, however, little doubt that he is very irritable. He claims that this has been the case only since the onset of the present trouble.

In engaging him in conversation, one is struck above all by the constant tendency of the head to turn to the left; presently his left arm moves, and he hooks with the index and third fingers flexed in the second and third phalangeal joints any available object within his reach in order to steady the arm. Meanwhile he fixes his eyes on the interlocutor, while his head turns slowly away from him. All this impresses the observer as extremely odd, and one is apt to misjudge his mental calibre.

He is unable to whistle, but claims that he never was a good whistler. He moves his tongue slowly from side to side, and dares not protrude it for fear that his jaws might close with a snap—an event which on a previous occasion caused him to bite his tongue severely. He grinds his teeth occasionally, but qualifies this as a bad habit. He masticates slowly, swallows ordinarily with ease, but at times he has to wait a number of seconds before the bolus can be pushed beyond the pharynx. The eyes are moved slowly from side to side, somewhat more rapidly, it seems, up and down. There is a great variation in the size of the pupils. On some days they are inordinately dilated and in a subparalytic state, reacting only little and sluggishly to light and accommodation; on others they seem of normal size and reaction.

Acuity of vision and extent of the visual field are normal. So far as the patient's peculiar affection, to be described later on, will allow it, he reads the papers without difficulty. The only trouble, as he avers, is that when he glances hurriedly at the headlines the letters are apt to run together.

Occasionally twitches in the facial muscles on the left side are observed. The skin covering the left side of the neck is markedly wrinkled.

The symptoms now to be detailed are of a twofold nature: 1st, paralytic; 2d, spastic.

The whole left side is weak; the grip in the left hand, as ascertained by the dynamometer, is only one-half that of the right, on his bad days only one-third. The head, if unsupported, is apt to drop forward after holding it erect for some time. The left arm cannot be raised beyond the horizontal when abducted; he raises it easier, but not quite to a perpendicular line, when adducted. The left leg is considerably weaker than the right one.

Accompanying this hemiparesis there are contractures in the left upper and lower extremities. As in ordinary contractures (late rigidity) in hemiplegia due to hæmorrhage in the internal capsule, the flexors in the arm and extensors in the leg are chiefly affected. The position of the

hand is characteristic. The fingers are clinched, the hand flexed at the wrist and pronated.

These contractures of hand and fingers are not permanent, however. Though with difficulty, the patient succeeds by a great effort of the will in extending the hand and opening the fingers. The latter process is a very singular one. The thumb, index, and third fingers are the first to obey the mandate of the will; after they have been extended a little while the fourth and fifth fingers follow slowly. The closing takes place in the inverse order: first, the fifth and fourth are flexed, then the others gradually close upon the palm of the hand. All these movements are executed reluctantly, as it were, on the part of the muscles.

He cannot keep the hand open except by the aid of the other hand or by pressing the palm against some flat object. There is also a tendency of the arm to be flexed at the elbow. This can be, however, easily overcome by the will.

The left leg is permanently extended at the ankle, and unless prevented from being so, by bracing the foot against some object, it stiffens at the knee. The foot is slightly inverted, the sole arched, the toes in the position of flexion characteristic of permanent contracture in late rigidity of common cerebral hemiplegia. The big toe presents the typical *hallux flexus* (hammer toe), the second, third, and fourth are flexed and abducted; the little toe turned inward under the fourth. A complete reduction of these contractures is impossible; being spastic in origin they have become organic by permanent shortening of the muscles of the calf. (Even in the chloroform narcosis during a subsequent operation they could not be reduced.) There is, then, talipes equino-varus of the usual type in spastic cerebral hemiplegia.

The right foot is nearly of the same appearance as the left, but instead of extreme flexion there is hyper-extension of the big toe and the varus complication is absent.

Both legs do not only stiffen and extend in the knees (unless prevented from doing so by mechanical means), but they also tend to flex in this stiffened state on the abdomen. Hence, the patient cannot lie on the back without the legs being in the air. Owing to this spastic stiffness in the knees he cannot cross the left leg over the right knee without the aid of the hands. The leg will stand out straight from, and at a right angle with, the body, until he grasps the foot by the heels and by pulling it toward the body, flexes the leg. The same may be said, though to a less degree, of the right leg. This he can cross over the left knee, but for some time the leg will remain in extension until it succumbs to the law of gravity and drops down, not suddenly, however, or at an even rate of quickness, but with intervals of arrest, after the cog-wheel fashion.

The spine is arched, the left shoulder, when standing erect, a little lower than the right; both conditions, however, can be almost completely corrected by an effort of the will. Though slowly and laboriously, the patient generally succeeds in straightening himself out.

The abdominal muscles on either side are stiff and retracted, the left pectoralis hard and unyielding. In fact, almost the whole muscular apparatus of the body is in a state of rigidity of varying intensity. The right arm is the least affected of the extremities; the right side of the face seems to be entirely free.

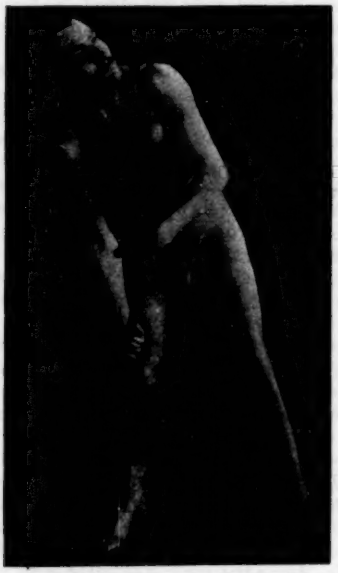
Every voluntary movement is at once opposed by the simultaneous contractions of the antagonists. The effort to overcome the latter causes

the odd appearance suggestive of the movements of an automatic wax figure. Owing to the constant counter-action of the antagonists he is unable, for instance, to shake his head, or with the good (right) hand to hammer a nail.

He experiences, however, occasional involuntary jerks in various parts of the body. These have been so violent at times that he has been in danger of being thrown from his chair.

During sleep, and especially when lying curled up in bed, the rigidity passes off, to reappear immediately on awakening and moving. Passive flexion and extension call immediately the antagonists into action.

FIG. 1.



The anthropoid walk.

His gait is of striking singularity. On several of his good days, perhaps three or four times within the last year, he has been able to go about for a short time without a stick. Ordinarily, however, he has to make use of this in order to move from place to place. In doing so he uses the right leg in spastic equinus position as a fulcrum, which he reinforces by the stick. This he grasps with the right hand, the right arm being extended in such a manner that the thumb is in front and the four fingers back of the stick. The palm of the left hand usually rests on the upper end of the stick. (See Fig. 1.) He now swings the left leg, which is in spastic extension, around and forward in a semicircle, with a kind of slide, scraping the floor; then, with a quick movement, he shifts the fulcrum (right foot and stick) forward, etc. All this while the head is turned to the left, the spine arched, the abdominal muscles retracted,

the platysma wrinkled, the tendinous insertions of the sterno-cleido-mastoid muscle prominent. The extremely clumsy and uncouth appearance, and the long stick which he uses for the purpose of locomotion, suggest at once the *anthropoid* walk.

In the ward he prefers to shift himself about, utilizing the hook-like flexion of the index and third fingers of the left hand as a means of securing a hold on the iron bars of the bedsteads, using, of course, the right hand also. Of late, however, when necessity compels him to move about, he prefers to crawl on all-fours—to the water-closet, for instance.

In walking with the stick it takes him some time before he gets well started. The first few shuffling movements (one cannot call them steps) being made, the movements become somewhat easier, but he soon tires and becomes exhausted.

During the erect posture his feet are separated about one foot and a half, the weight of his body resting exclusively on the balls of the feet and the flexed toes.

He cannot walk with the feet naked on account of the pain occasioned by the pressure of the body on the tips of the toes.

Sensibility: There is no sensory disturbance of any kind; the patient recognizes, the eyes being closed, the slightest touch with the bedclothes, a sheet of paper, or the gentle blowing on any part of the body.

Reflexes: The superficial reflexes are all present. There is no difference between the right and left abdominal reflexes.

The knee-jerk would be, to say the least, brisk, if it were not for the antagonists preventing the excursion of the leg on tapping the tendon. That there is an increase can be demonstrated by the indirect tapping. The index finger being placed with the palmar aspect on the patellar tendon, the slightest tap on the dorsum which, under normal conditions would not produce a reaction, is followed by a distinct contraction of the quadriceps muscle. This method of demonstrating the exaggerated knee-jerk in spastic states of the muscle in which the excursion of the leg is prevented by the contraction of the antagonists, was demonstrated to me by Dr. S. Weir Mitchell on the occasion referred to above. The electrical reaction, both muscular and neuro-muscular, is normal. The mechanical irritability of the muscles, especially when in a spastic condition, is increased at times.

Spasms: In addition to the permanent and transitory contractures, he has distinct attacks of spasms of a peculiar kind. These vary in frequency and intensity just as his other symptoms do. There are days when he has one every five minutes; there are others when he has only ten or twelve. They are brought on by exertion and emotions, but they also occur spontaneously. He can bring them on himself by contracting certain muscles, but has also the power of controlling them to a limited extent. It is especially those that he brings on himself (for purposes of demonstration), but only to a small extent the spontaneous ones, that he can in a measure stop in their progress.

Beginning, progress, and nature of the spasms: They are initiated by a slight tremor of the head. They commence invariably in the muscles of the neck, and more specifically in the platysma myoides, as evinced by the deep creases seen in the skin covering it. The head turns slowly to the left, the eyes are closed, the left angle of the mouth retracted and depressed, the frontal muscle corrugated, the eyebrow arched.

At the same time, or a short time afterward, the arm, with the hand

clinched and flexed, is extended and carried forward, then flexed and adducted so that the wrist and forearm grate the abdomen and lower ribs. Generally, however, he does not allow this movement to go through its entire course, but grasps the seat of the chair on which he sits in order to steady the arm.

Occasionally another movement takes the place of the one just described. The clinched fist is supinated, the forearm flexed on the upper arm. In this position the upper arm is raised by the muscles of the shoulder, and the forearm brought up to a level with the occiput, so that the fist rests on the latter. At this juncture the patient generally carries the arm over the head, and it gradually goes down by his side in a semi-flexed position.

After the spastic movements of the arm, which, as stated above, occur often simultaneously with those in the neck and face, the left leg is extended at the knee, the talipes becomes more pronounced; it is flexed on the abdomen; after this the right leg is attacked, and the same muscle-groups as in the left enter into the state of contraction. The spasm never reaches the right arm, but a slight tremor is experienced in it and the right leg, winding up the series of the spasm.

Meanwhile the arching of the spine ordinarily present has become more pronounced, the trunk is rotated, the muscles of respiration are also involved. Breathing becomes for a short time impeded. The head is now retracted, and no more deflected to the left. The patient opens his eyes and the spasm abates in those muscles first in which it commenced, *i. e.*, in the muscles of the neck on the left side. Sometimes at this juncture the head slowly rotates to the right. Ordinarily, however, this rotation is voluntary, and resorted to for the purpose of relieving the muscles of the neck concerned in the spasm. Then, one by one, the other muscle-groups limber up to a certain extent, never entirely so. The order of the spasms is always the same. They never take place in the inverse direction, from the right foot to the left, for instance. They never extend beyond the right leg. These spasms are, as stated above, in a measure under the control of the will. They can be modified and lessened in their intensity. They can also be brought on voluntarily by the patient contracting the left platysma myoides, and inclining and turning his head to the left. Often they are aborted, the contractions remaining confined to the muscles of the left side of the head and left arm. The original locked spasm during which the left arm is drawn across the chest does not occur any more.

Consciousness has never been lost, or even dimmed. A frequent repetition of the spasms has a weakening but not absolutely paralyzing effect on the muscles involved.

Résumé: A brief recapitulation of the history, symptomatology, and the present state of the patient presents these features:

At first (three years ago) there is a spasm localized in the muscles of the left arm and neck. This, in the early stage of the disease, occurs periodically, twice a day. Later on, more frequently, and at irregular intervals. Six weeks later a contracture in the left foot sets in, and hemiparesis becomes manifest, together with contractures. Gradually the right leg becomes plastic. The spasms now attack in a serial order, or at least nearly so, various groups of muscles, starting invariably in

the neck. All the symptoms, spasms, contractures and weakness, get progressively worse.

Clinical diagnosis: Cerebral paralysis (hemiparesis) with contractures, complicated with tonic intermittent spasms.

Seat and Morbid Nature of the Affection.—There can be no doubt as to the topical diagnosis. There is a well-known clinical picture which is vividly recalled by our case—that is, congenital cerebral spastic paralysis. The paresis, with contractures and the accompaniment of every emotion and physical exertion by spasmodic movements, stamps it at once as one akin to this form of paralysis. There are, indeed, some cases of infantile spastic hemiplegia which, barring the mental defect ordinarily accompanying it, present the identical motor disturbances of our case.

Unlike the ordinary cerebral hemiplegia with late rigidity in adults due to hemorrhage, our case commenced with spasms limited to the muscles of the head and arm on the left side. There was then, probably, an irritating lesion of some kind pressing either on the centres presiding over those movements, or their conducting fibres. This lesion, being a discharging one at first, must by slow growth have developed into a destroying one, causing paresis on the opposite side. Since the sensibility is everywhere intact, it stands to reason that this lesion (undoubtedly a coarse one) is high up in the motor tract, where there is an absolute separation of the motor and sensory tracts and centres. We have to look, therefore, as the probable seat of the lesion, not to the internal capsule, the common seat of coarse lesions, notably hemorrhage producing hemiplegia, but to a higher level, the corona radiata, or the cortex itself.

The steady but slow progress of the disease, the appearance of spastic symptoms first, and of the paralytic later on, suggests at once the existence of cerebral tumor of slow growth in or beneath the Rolandic region.

Again, the serial order of the tonic contractions justifies one in thinking of Jacksonian epilepsy, which, as is well known, is caused in the majority of instances by a coarse irritating lesion in the psycho-motor area. It is true, there are never any clonic spasms, no general convulsions, nor ever any loss of consciousness; yet, there is a distant resemblance to an epileptic attack of the Jacksonian type in the periodical spasms of our patient. As an old-time, sun-bleached daguerrotype still reveals the essential traits of the picture to one familiar with the person it represents, so there are here the indisputable elements of Jacksonian epilepsy.

Even idiopathic or genuine epilepsy, so called, presents in many instances, features which we find in our case. The rotation of the head, the retraction and depression of the angle of the mouth, the simultaneous

locking of the arm, such as is produced by faradizing Erb's point, the closing of the eyes, the initiatory and concluding tremor, and finally, the impediment of respiration, are more or less suggestive of an epileptiform nature of the spasm. It is true, the tonic character of the latter throughout, and the absence of the clonic variety, stamp our case as quite an exceptional one. Still, reasoning by exclusion, and considering the fact that the spasms start always in the same group of muscles, a tumor in or near the centre presiding over those movements suggests itself.

There are two possibilities as to the seat of the supposed tumor. The history of the case, as given by the patient himself, would point to a region in the cortex in or near the centre for the movements of the arm and the rotation of the head. But a close observation of the patient during the spasms, and when free from them, shows that the contractions of the platysma and the flexion of the hand always initiate the spasm, and that in the aborted ones these movements alone take place. Hence, with great probability, we have to look to these centres or their immediate neighborhood as the seat of the lesion. These centres (platysma and wrist) are, as is well known, in close juxtaposition.

From here, as in the physiological experiment, the irritation travels upward, involving the centres for the movements of the shoulder, head, leg, and foot on the same side, leg and foot on the opposite side. Arriving at these centres the irritative force is exhausted, it seems. If it were to go beyond to the arm-centre, and to the centre opposite the one it started from, namely, that of the platysma, there would be, probably, general convulsions and loss of consciousness. These never occurred, as remarked before. But even the arm-centre for the right arm must be in an irritated condition, since there is an inhibition to all intended quick movements, the antagonists entering into activity immediately. There is also a tremor in it at the end of the spasm, denoting in all probability the ultimate radiations to this member of the discharge of accumulated nerve energy.

Absence of Symptoms Ordinarily Accompanying Brain Tumor.—However, though the serial order of phenomena and the *signal* symptom (in the sense of Seguin), as manifested in the simultaneous contraction of the platysma myoides and the flexion of the wrist, point to the existence of a tumor in or near the respective cortical centre on the opposite side, one of the most important cardinal features of brain tumor is absent—headache. The patient has at no time suffered from it, except during a brief period of his career as a workman in a mining mill, where everybody was subject to this trouble. He never complains of it now. According to Mills and Lloyd, in only five of cerebral tumors has headache been missing.

He has never had vertigo, and as to the mental hebetude which generally accompanies brain tumor no trace can be discovered. He is a

close observer and a good judge of his surroundings and of his own condition.

Yet, a mental peculiarity to which Wernicke[1] has called attention is present. He lacks initiative in conversation; he never commences one; but when addressed on a subject enters into it with intelligence and interest. It is also difficult to engage him in a conversation about a topic not connected with his case.

Again, the very pronounced form of contractures in this case of hemiparesis is suggestive of tumor, and the implication of the leg on the other side corresponds with the observations of Hughlings Jackson[2] on this point, who, as early as 1874, pointed out this fact as a peculiarity of hemiplegia caused by tumors. He designated it as the third degree of hemiplegia.

The contractures in our case are of the usual type, whether produced by hæmorrhage or tumor—*i. e.*, the flexors predominate in the arm, the extensors in the leg.

The question as to cortical or subcortical is hard to solve. Burdon Sanderson claims to have demonstrated that stimulation of different points in a horizontal section, through the deeper parts of the hemispheres, produces the same effects as stimulation of the so-called centres. This observation taken together with the hemiplegia with contractures, which points to a destruction of conducting fibres, makes a subcortical seat probable.

Whether the contractures in a case of hemiplegia are always due to a descending degeneration, as Charcot maintains, seems to be as yet a mooted question. Besides, degenerative changes in the motor tract, irritative changes in the dura, and slight but continued irritations of the cortex may give rise to them.

All these considerations leave the cortical or subcortical seat undecided.

As to the histological nature of the supposed tumor only surmises are admissible. Glioma, fibroma, lipoma, a cyst, perhaps a cysticercus, may be thought of. With great probability it is not malignant.

But, as has been time and again stated by all competent observers, a diagnosis of brain tumor is hazardous, and remains doubtful until the existence of choked disk is demonstrated. The patient's sharpness and range of vision speak against such a complication. But after the tumor had been diagnosed and localized from other symptoms, an ophthalmoscopic examination, made by Dr. H. L. Wolfner, of this city, has revealed a beginning choked disk, which clinches the diagnosis.

The foregoing remarks, as stated above, were made at a meeting of

[1] Gehirnkrankheiten, iii. p. 303.

[2] British Medical Journal, July 25, 1874.

the Medico-Chirurgical Society of this city. The diagnosis of partial choked disk was confirmed by Drs. Alt and Barck, and a consultation as to the advisability of an "exploratory craniotomy" was held with a number of prominent members of the St. Louis medical profession. No material objection was raised against the operation.

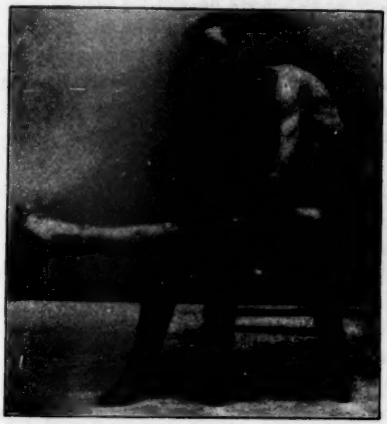
The question of operative interference was rendered especially difficult to solve by the fact that no case of this nature is on record. The literature does not show an instance, as far as I know, in which the symptom-grouping as described had led to an *intra-vitam* diagnosis of tumor; much less is an operation recorded. But taking all things into consideration, above all the progressive character of the lesion, and the declaration of the patient that he would prefer death to a life under such circumstances, the operation was deemed justifiable. It was not, as a matter of course, expected that a complete recovery was in the range of possibility. The tumor, or whatever other coarse lesion would be found, had necessarily destroyed brain substance enough in the motor area to set up some degree of descending degeneration. This could not be done away with, but its spread might be arrested by operation, and the very annoying spasms which made his existence almost insupportable might be eliminated, leaving the case as one of cerebral spastic paralysis, with a prospect of less impeded locomotion and prolongation of life.

EXPERIMENTS.—Experimentally the following results were obtained: The bromides, in doses of 90 to 100 grains, did not arrest the spasms, but made him feel more comfortable, provided physical exertions and emotional disturbances, such, for instance, as were connected with medical examinations, were avoided. Strychnine, $\frac{3}{10}$ of a grain daily, increased the number and intensity of the spasms, and made him feel weaker and generally miserable. Although there never was a decided paralysis after a spasm, a considerable degree of weakness could be demonstrated, principally in the left arm, on his bad days. The head also would, under such conditions, be more apt to drop. Unfortunately, no attempts at measuring the temperature over the supposed seat of the tumor were made. This omission is the more deplorable, as probably, in the light of later developments, positive data of diagnostic value might have been obtained.

Such positive results, however, were obtained with electricity. I will state at the outset that, like disturbances of any other kind, electricity, no matter how or where applied, would aggravate all the symptoms, and, if persevered in for any length of time, would insure a sleepless night. But discounting these general effects, certain modes of application to certain places could be demonstrated to be followed invariably by the same phenomena. Thus, whenever a faradic current strong enough to elicit muscular contractions from the motor points was applied

to the left platysma myoides a typical spasm would result. The application of the same strength to the right platysma was without result.[1]

FIG. 2.



In a state of hemilateral spasm induced by faradic stimulation of the platysma myoides.

Again, wetting the scalp on the right side of the head, and applying a five-square-centimetre electrode, with a galvanic current of 3 to 4 milliampères interrupted 60 to 90 times a minute, to the area where, at a rough guess, the centres for the platysma, movements of wrist and fingers, and rotation of the head are situated, the same spasms of the same sequence were produced. The positive or negative pole was used, apparently with the same effect. The indifferent electrode was placed either to the left of the sternum or on the left side of the left scapula, in order to avoid the electrical excitation of such muscles as could of themselves be thrown into a tonic contraction by the stimulus, notably the left platysma and the muscles of the left arm. Counter experiments were made in sufficient numbers, and with the necessary precautions to exclude any possible sources of error, and the fact was established that faradic irritation of the left platysma myoides and a galvanic current interrupted from 60 to 100 times in a minute, applied over the cortical centres from which the spasms were thought to be originated, invariably gave rise to the same serial order of phenomena. Thus the faradic peripheral irritation of the "signal" muscle, and the transmission of the

[1] The spasm during which the photograph of the patient was taken was thus experimentally produced.

interrupted galvanic current through the motor "starting" centres, were capable of producing the identical spasms.

One fact may be expressly mentioned here, viz.: that a strong faradic current applied over the centres, the other electrode being on the opposite side of the skull, or at any other indifferent place—*i. e.*, not *particularly* liable to spastic contractions—did not yield any results.

Thus matters stood when, an exploratory trepanation having been determined upon, the head was shaved for craniometric purposes. To my great satisfaction an old scar was discovered about two and a half inches above, and a little back of the external auditory canal. The patient himself had been unaware of the existence of such a scar, and from its appearance the injury producing it must have dated back many years, possibly to infancy. This scar, about one-third of an inch in length, was about parallel to the sagittal line of the skull, not painful, and seemingly movable. This was an additional sign corroborative of a cortical lesion of the right motor area of the brain.

The electrical tests, most of them made in the presence of Drs. Herman and Wolfner, of this city, were now much more striking. It was demonstrated that the interrupted galvanic current applied just to, or in the immediate neighborhood of the scar, was, with unvarying regularity, followed by an attack of spasms. From the nature of the case these experiments, though sufficiently numerous to prove beyond a doubt the experimental facts as just described could not be continued long, or repeated often, since experience had taught me that one spasm predisposed the patient to another one, and he dreaded and disliked such experiments.

Another fact worthy of note was also evolved experimentally. The patient, as remarked at another place, had never during the course of his ailment complained of any trace of headache. The first application of the interrupted galvanic current (before his head was shaved) produced a pain at the seat of the application which extended to the forehead, and lasted half a day. During the subsequent electrical tests the same region was always more susceptible to the painful effects of electricity than any other.

With the foregoing data on hand the patient was prepared for an operation.

Report of Operation. By Dr. Carson.

Joseph McE. was received into the St. Louis Mullanphy Hospital March, 1890. His general condition was good, and with the exception of the cerebral trouble his health was perfect. Immediately after his entrance into the hospital preparations for the operation were commenced. They consisted in warm baths at night, regulating the secretions, and shaving and washing the head.

March 26. The patient was brought to the operating table. One hour before he had had administered, *per os*, two drachms of fluid extract of

ergot, and one-half hour before one-fourth of a grain of sulphate of morphine, subcutaneously. In the presence of a number of physicians and surgeons of this city, an Esmarch band having been applied around the head, and under the most strict antiseptic precautions, the operation was commenced. The site of the scar, shown in the accompanying cut[1] (Fig. 3), was marked on the bone by a small drill hole. The surface

FIG. 3.

Showing the fissure of Sylvius and the fissura Rolandi, drawn with the aid of Wilson's cyrtometer. The dark spot at the angle formed by the convergence of the fissure of Sylvius and fissura Rolandi represents the site of a small cicatrix which has been enlarged about four or five times by applying lamp soot. The line anterior and parallel to the fissura Rolandi represents the præfrontal sulcus.

of the cranium was then exposed by a rectangular flap, including the pericranium, three inches broad by four inches in length, with its base forward. The pin of an inch and a half trephine was then applied at the site marked by the bone-drill, and a corresponding button removed.

This was a task of some difficulty, on account of the temporal ridge being included in the circle of the trephine. Upon the removal of the disk of bone the dura mater bulged boldly into the opening. This was slightly opaque, and all normal pulsation, both on inspection and palpation, was absent. The trephine opening was then enlarged by the rongeur forceps until it was about two inches square. As the dura was removed the brain pushed rapidly through the incision and protruded nearly an inch beyond the outer surface of the cranium. The vessels of the pia covering this protruding mass were enlarged, turgid, and tortuous, while the cortex underneath presented a reddish-brown appearance, and was readily compressible, and would rapidly refill after having been compressed.

The tumor could be outlined on three sides, above, below, and behind, while in front it seemed continuous with healthy brain substance. An exploring needle was introduced to the depth of an inch and a half,

[1] The size of this scar is much exaggerated in the picture, it being in the original very small and indistinct.

when it seemed to meet with more resisting tissue. Its withdrawal was followed by a flow of serum, and afterward by pure blood; this in turn was followed by a partial collapse of the tumor, but it was only of momentary duration, as it soon became tense as before.

Wishing to increase the size of my opening somewhat I again used the rongeur, and in so doing, unfortunately, my forceps slipped and lacerated the surface of the presenting tumor. According to the statement of one of my colleagues, this was followed by an escape of a considerable quantity of reddish-brown fluid, which I did not see. Free bleeding followed from the lacerated surface, which could only be controlled by compression. This surface was of a dark reddish-brown color. The finger introduced into this laceration entered to the depth of about a half inch or more, and took a direction forward about an inch, when it entered a cavity the size of a small hickory-nut, with smooth walls, and which seemed to be surrounded with healthy brain substance. Then, with the handle of an old spoon, sharpened by long use, I proceeded to remove the protruding mass, which was exceedingly friable, breaking down rapidly, and coming away with the utmost facility. This procedure was continued until apparently healthy tissue of normal consistency was reached. Macroscopically the mass removed presented a mottled, dark-brown, yellowish, and partly gelatinous appearance. Some of the pieces seemed to consist of brain substance traversed by dense punctiform hæmorrhage, whereas others were made up of a dark-red shreddy material (no doubt stroma of the cavernous angioma, subsequently diagnosed by the microscope). This included, for the most part, the cortex, but extended also into the subcortical region. The part removed was about the size of a large walnut, and made quite a cavity, which was rapidly filled by healthy brain matter. After the removal of all the diseased tissue the surface was cleaned, and a rubber drainage tube introduced to the bottom of the cavity. The dura mater was then replaced, and sutured with a continuous catgut suture. The trephine button and bone clippings, which had been preserved in warm bichloride cloths, were then replaced, the button being attached to the flap with catgut sutures. Three horse-hair drains were put in position under the flap, which was closed with a continued catgut suture. A slight bichloride gauze dressing was applied over all, and the patient returned to bed.

The operation lasted two hours, and when completed the condition of the patient was not good. During the operation much blood was lost, not from any one or more distinct points, but from a general oozing from the entire surface of the wound in the brain. This bleeding was not controlled in the least, either by the application of hot water at 120° Fahr., or by the application of a ten per cent. solution of cocaine. The patient was returned to bed, the feet elevated, and a subcutaneous injection of digitalis and brandy given, and warmth applied. The operation was completed at about 1 o'clock in the afternoon, and at 5 o'clock the patient had partially reacted. By 10 o'clock P. M. reaction was complete.

It will not be necessary to go into a detailed account of the progress of the case. Suffice it to say that the convalescence was uninterrupted, the highest temperature reached being 99.6°. The rubber drain was removed at the end of forty-eight hours, and the horse-hair drains at the end of the third day.

The improvement in the patient's symptoms has been most decided,

the spasms having entirely disappeared since the operation. Three days after the removal of the tumor the evidences of paralysis, noted by Dr. Bremer, were exaggerated, but no new groups of muscles were involved. There was complete loss of power of the muscles of the back of the neck, and the power of raising the left arm to the head was lost, as was also the ability to extend the left hand, which had completely lost its grip, Anæsthesia was complete in the arm and over the platysma, partial in the left side of the face. This condition was unchanged two weeks afterward. At present, five weeks after his admission into the hospital, the patient sits up in bed, moves himself freely without assistance, and has regained to some extent the use of all the muscles paralyzed by the operation.

There has been no return of the spasms. The only evidence of his previous condition remaining is a slight spasticity in the legs, more marked in the right than in the left. He is now able to lie in bed upon his back, extended to his full length, a condition impossible before the operation. There is a loss of muscular sensibility in the left hand, most pronounced in the fourth and fifth fingers, which are, moreover, almost completely anæsthetic, only a sharp pinch or a deep prick with the needle being perceived. General sensation, to wit, sense of pain, pressure, and temperature, is also impaired in the three remaining fingers, least of all in the thumb, in which, however, as in the rest of the fingers, the muscular sense is entirely absent. In an effort at locating the seat of the pain produced by the prick of a pin, he makes frequent mistakes, least so when the thumb is the object of experiment. In addition to the fourth and fifth fingers the ulnar side of the hand and three-fourths of the arm are paralyzed.[1] At first there was a slowness in answering questions; apparently he had to collect his words before he could reply, but after his sentence was made up there was no hesitation in utterance. This has all disappeared, and he now replies to questions promptly and without delay.

The scalp wound completely healed in less than a week, and at present shows little evidence of the injury inflicted, the replaced bones having apparently united, as the surface of the cranium is smooth and solid, and it is with much difficulty that the site of the operation can be made out.

The fissure of Rolando was located by two different methods. First, by Thanes's method, and then with a Wilson's cyrtometer. The fissure of Sylvius was located by the usual method. The scar was found to lie at the lower end of the ascending parietal convolution, as indicated by the accompanying diagram, corresponding to the platysma-centre in Ferrier's scheme. The intention had originally been to trephine midway between the platysma and the head-centre—*i. e.*, in a line from the lower end of the ascending parietal obliquely forward and upward. The finding of the small scar changed the plan.

So far as I was able to determine, the cavity in which I introduced my finger involved a part of the ascending frontal convolution, extending somewhat into the base of the second frontal convolution.

[1] There is now, in the seventh week after the operation, a slow return of tactility and muscular sensibility.

The following conclusions were drawn from the results of the operation: First, that the Esmarch bandage completely controlled the hæmorrhage from the scalp wound. Second, that the administration of ergot (*per os*) and morphine subcutaneously must have had a very decided influence upon the hæmorrhage from the brain surface; although this was considerable, it was nothing to what we should have expected, considering the nature of the tumor, had not some influence been exerted upon the vessels by the drugs. Third, that the application of ligatures to the vessels in the brain substance is not such a difficult task as we are led to believe from reports; the forceps held well, and with care the ligatures were applied without difficulty. Fourth, that the cocaine solution, ten per cent., and hot water at 120° Fahr., applied to the bleeding surface, exerted no influence whatever in checking the hæmorrhage; pressure was the only means that seemed to control it in the least. Fifth, the impressions conveyed to the finger by the tumor are worthy of note. The whole tumor could be entirely compressed, and felt much softer than the surrounding brain substance. While there was not the slightest approach to fluctuation, yet the feeling was that of a fluid displaced by the pressure; upon removing the pressure the tumor rapidly refilled, and presented through the cranial opening.

The masses removed by the operation consisted partly of shreds of reddish-brown appearance, partly of fragments of brain substance of variable appearance. While most of it bore a mottled aspect, caused by brown spots of varying size and separated by the intervening brain substance at different intervals, other pieces looked more homogeneous and gelatinous-like.

The whole mass, as removed, was collected in Müller's fluid, and a microscopical examination showed that the coarse lesion producing the peculiar symptoms in Joseph McE.'s case was an *angioma cavernosum*.

Concluding Remarks by Dr. Bremer.

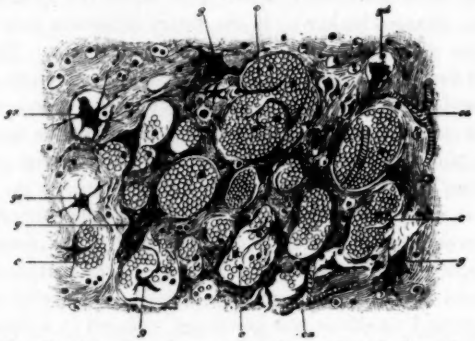
Microscopical Examination.—Many sections of the brownish mottled-looking particles of brain, representing cortical and a small amount of subcortical layer, were made vertically and some horizontally to the brain surface. Without staining, and examined simply in water or glycerin, the sections exhibit round and irregular brown spots of varying size, some with fluted outlines, interspersed in seemingly normal brain substance, both in the cortex and in the subcortical regions. Some sections look perforated because the brownish masses, which are made up of blood, have fallen out; these sections have a meshy, or, as it were, a worm-eaten appearance. In other specimens a fan-like arrangement of the brownish masses, radiating from the depth to the periphery, can be seen. (Elongated caverns run parallel to the radiating nerve-fibres and vessels in the subcortex.)

Of the various staining substances tried, an aqueous solution of gentian-violet gives the best and most characteristic pictures, a bluish mass (the brain substance), dotted with round and irregular yellow spots (the blood in the caverns). Whereas in the depths of the tissue, pointing toward the radiating crown, loose, irregular meshes of a longitudinal arrangement (parallel to the course of the cortical and subcortical blood-vessels) can be demonstrated, filled with blood, the character of the morbid mass changes higher up in the cortex, wherever this is involved —and in the vast majority of sections examined it is. There, in the cortex—and for that matter, in the subcortical conducting substances, whenever moderately involved in the pathological process—the genesis of the latter can be seen. The blood circulating in the main mass of the spongy tumor in the deeper parts of the brain, in its endeavor to expand to the higher and neighboring districts, utilizes the preformed lymph spaces surrounding the cortical and subcortical arterioles, establishing an ever expanding extra-arterial current. The same obtains in the lymph-spaces of some capillaries. Owing to the peripheral pressure thus produced by the extra current of blood the vessels are in some places compressed, in others atrophied and reduced to a thin, irregular thread; in still others completely obliterated. In the more advanced stages of the pathological process the surrounding brain substance forming the interspace of the respective vessels atrophies, and the remnant now appears as partitioning walls of the caverns filled with blood. Thus a sponge-like arrangement results in those places where pressure and consecutive atrophy of the brain substance have been most pronounced. There is no cell-lining to the caverns. In some instances the cortex has entirely disappeared and the blood caverns extend to the surface, separated from the pia mater only by an exceedingly thin strip of an amorphous substance.

The giant pyramidal cells in the neighborhood of the caverns have, through pressure, changed their forms to the spindle shape; others have conformed to the new order of things, and their lymph spaces having been invaded by the blood-stream, they have become part and parcel of the meshwork or stroma, as it were. Under these circumstances they have adapted their shape to the new requirements, their processes describe arcs and seem to interlace with the processes of the neighboring ganglionic cells (after the fashion of the branches of two neighbor trees). Some of the ganglionic cells are characteristic for the comparatively intense tint which they have assumed, denoting that the micro-chemical reaction to the staining material is more active in them than in the rest of the cells of the same kind. Is this deep stain due to a chemical change in the protoplasm caused by functional hyperactivity? And is the latter caused by the overgreat amount of the nourishing fluid in which they are, so to say, constantly bathed? These seem to me legiti-

mate questions to ask, but they cannot at present be definitely solved. In looking at some of the ganglionic cells in Fig. 4, one is struck by their resemblance to the spider-cells found in the various chronic inflammatory cortical affections. This would seem to lend support to Kleb's view, who regards the spider-cells as degenerated ganglionic ones.

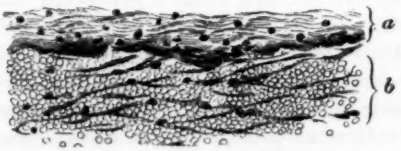
Fig. 4.



g. Ganglionic cells of varying shapes; some have adapted themselves, by pressure, to the contours of the blood caverns, practically forming part of their walls or stroma. *gd*. A degenerated ganglion cell. *gs*. Ganglionic cells approaching the spider-cell type. *c*. Caverns filled with blood. *ca*. Capillaries.

The masses removed and examined come, no doubt, from the lower end of the ascending parietal convolution. In this, we know, the giant pyramidal cells are to be found only in the immediate neighborhood of the central fissure, whereas the hind portions of the convolution are devoid of such cells. From my specimens I conclude that only a small

Fig. 5.



a. Layer of compressed and necrosed brain substance. *b*. Tumor mass showing the stroma.

part of the cortex near the central fissure is represented in the removed mass, the main bulk coming from the posterior part of the ascending parietal. This conclusion is based on the absence of the giant-pyramidal cells in the vast majority of the tissue-pieces examined.

In some portions the cortical, and to a varying extent, the deeper

masses have lost their structural peculiarities; the pyramidal cells and (subcortically) the medullated nerve-fibres have disappeared and a finely granular and reticulated tissue, dotted to a varying degree with round cells, has taken their place. It is atrophied brain substance. There is also evidence of inflammatory activity in some parts, there being round-celled infiltration, especially around necrosed islands of brain tissue.

Angiomata of the brain are not very rare tumors. Mills and Lloyd[1] mention their occurrence, but do not speak of angiomata cavernosa. As a rule, cerebral angiomata are congenital; there is no new formation of vessels, but simply a telangiectasis. In this case there was possibly at first such a congenital angioma, which under strain ruptured, the blood suddenly inundating the neighboring peri-arterial lymph spaces. The sudden increase in the growth was great enough to produce a discharge of nerve energy in the shape of a locked spasm, but it was not large enough to act as a destroying lesion. This took place later on when the patient began to limp. Since he grew gradually but constantly worse, it stands to reason that the tumor was constantly growing. The final result would probably have been rupture of the whole mass and death of the patient by apoplexy. Was the injury which produced the scar concerned in the production of the angioma, or was it only an incident that this insignificant remnant of a very old trauma happened to be found in the region where the tumor had been located? And with which arterial system did the meshwork communicate? The radiating and fan-like arrangement alluded to above, points to branches of the lenticulo-striate artery.

General Considerations.—The one clinically recognized form of disease which our case resembles more than any other is infantile spastic hemiplegia. In this, as in our patient, the spastic symptoms often overshadow the paralytic ones. These spastic phenomena, the irritative contractures, as well as the involuntary movements accompanying, or even preceding, not only bodily movements, but also emotion and speech, we meet with in this case. But, instead of being post-hemiplegic motor disturbances, as they ordinarily are, they occurred before any decided hemiplegia set in—*i. e.*, they were *pre*-hemiplegic. There were first mono spasms, afterward hemiplegia.

The articulatory disturbances are not exactly such as one finds in the infantile forms of spastic hemiplegia; but there is in some cases of this disease a peculiarly explosive form of speech, accompanied by spastic movements of a tonic nature, in the face and various parts of the body, which reminded me very much of the patient's articulatory defect.

One word about the serial order and the frequency of the spasms. Hughlings Jackson, the ingenious observer of the kind of epilepsy which

[1] Tumors of the Brain, etc. Pepper's System of Medicine, p. 1049.

bears his name, takes it to be an explosive discharge of the ganglionic cells which are overloaded with nutritive material, and attributes it to the irritation and hyperæmia existing in the neighborhood. It is probably owing to this extreme degree of blood-supply, caused by the angiomatous character of the superficial substance of the cortex, that the frequent discharges took place, as evidenced by the tetanoid contractions and the serial spasms. It is, perhaps, rather hazardous, but I cannot forbear to suggest a possible causal relation between the peculiar forms and chemical behavior toward the staining agent on the one hand, and the spasms on the other.

The frequency of these discharges explains further the almost exclusive occurrence of tonic—*i. e.*, milder—spasms, the clonic ones requiring, as it were, a larger amount of stored-up energy. The contractures which, it had been hoped, were due, before the operation, to irritation of the dura mater, or the cortex, owe probably their origin to a descending degeneration. Such, at least, is the inference from the existence of the considerable defect of subcortical nerve substance.

The final developments in this case tend to verify Seguin's view as to the distinguishing symptoms between strictly cortical and subcortical tumors: "In favor of subcortical location of tumor (speak) local or hemiparesis, followed by spasm; predominance of tonic spasm, absence, small degree or very late appearance of local headache and of tenderness to percussion." (*Med. Record*, Feb. 13, 1886.)

The facts stated elsewhere that the left fingers, and partly the hand and the ulnar side of the arm, are anæsthetic, and that the fingers have lost their muscular sensibility, and that the platysma region was for weeks completely without sensation, whereas the face felt only numb, are, perhaps, calculated to throw some rays of light on the vexed question as to whether, and to what extent, the motor centres subserve, beside motion, tactility and muscular sensibility.

It will be remembered that before the operation there was not the slightest evidence of any sensory disturbance noticeable about the patient. The simultaneous abolition of sensation in the platysma region, and in the fingers and part of the hand and arm after (at any rate partial) ablation of their motor centres, would, to say the least, go to prove that the sensory cortical areas for regions which are outwardly so far apart as the platysma and fingers, and whose motor centres are so close together in the cortex, must be situated in close proximity. The paresis (before the operation) without any involvement of sensation, speaks in favor of differentiation in the cortex; the paralysis with anæsthesia after operation (removal of a comparatively small area) points to a more or less common cortical seat of motor and sensory functions. If these sensory areas (including tactile and muscular sensibility, and sense of pain and temperature) are at all separate from the motor centres, they must be immediately

behind their respective motor areas. Now, it seems pretty certain that the function of voluntary motion resides only in those parts of the cortex in which the giant pyramidal cells are met with; again, the larger part of the diseased brain mass, subjected to a microscopical examination, does not contain them, and is consequently derived from the posterior portion of the lower part of the ascending frontal convolution, possibly in part from the anterior margin of the parietal lobe, and the loss of sensibility might be explained on this ground.[1]

Taking everything into consideration, I am inclined to favor Starr's view, who asserts "That perceptions occur in the gray matter of the cortex of the central region and parietal convolutions, and that the various sensory areas for the various parts of the body lie about, and coincide to some extent with the various motor areas for similar parts, but the sensory area is more extensive than the motor area, extending into the parietal behind the motor area, which is confined to the ascending frontal and parietal convolutions."

The patient cannot tell when his fingers are passively flexed or extended. He feels a sharp pinch, or the prick of a pin, but he cannot locate it. Therefore, muscular sensibility and the faculty of locating cutaneous impressions (tactility) must have common centres that lie close together. It is probable that a considerable portion of the centres for the fingers was removed, the trephine hole having been made, in my opinion, rather above the platysma centre; and yet the grip is now pretty good. Is it owing to substitution centres that motor power is returning, or are we permitted to think of a *lower* centre as presiding over these coarse motions? The fact that he cannot move a finger alone, but has to flex or extend them all, might, perhaps, speak in favor of such a supposition. The thumb-centre seems to have suffered least, since he can move it in every direction, and since tactility is demonstrable to some extent.

The statement will be remembered that the ring and little fingers were weaker than the index and middle ones. The operation intensified this weakness, and in the same degree corresponding to the extent and severity of the paralysis, impairment of sensation took place. *Pari passu* with motion, sensation returns. The index and middle fingers were, after operation, as they had been before, his best, both as to motor power and sensation.

Recent experiments of Ferrier, Horsley, and Schäfer, place tactility in the limbic lobe. The facts in our case cannot well be reconciled with such a view, unless we assume that, in introducing his finger into the

[1] The possibility must be admitted, however, that cortical substance not possessing the structure characteristic of the motor areas may, after all, be endowed with motor functions, especially in fields for such weak muscles as the platysma, perhaps respiratory and abdominal muscles, etc.

cavity, the surgeon injured the sensory conducting fibres going to that locality, but it would be hard to understand how only those for the fingers and the platysma could have been injured.

The exacerbation of all the symptoms on physical exertion and emotion is easily explained in this way: The tumor amounted practically to a blood-cyst, which communicated with the arterial system. Any increase in the activity of the heart (exertion and emotion) necessarily increased the supply of blood to the cyst, increasing the pressure and stimulating the ganglionic cells.

A later history of this case will be published in due time.

RESPIRATORY PARALYSIS AFTER DIPHTHERIA AS A CAUSE OF PULMONARY COMPLICATIONS, WITH SUGGESTIONS AS TO TREATMENT.

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A perusal of some of the literature of diphtheritic paralysis leads me to think that too little attention has been paid to the effects of paralysis of the muscles of respiration on the movements of the chest and to the affections of the thoracic viscera which may result therefrom.

That the muscles of ordinary respiration are liable to this form of paralysis is presumably accepted by every one; yet I have been surprised to find how comparatively few observers have recognized this complication, even in hospital practice, where it should be relatively frequent. Moreover, the condition is not absolutely rare, seeing that in the course of the last four years at least fifteen cases of it have come under my personal observation.

Recent writers on diphtheria, whilst discussing at length the varieties of cardiac paralysis, say little or nothing about the effect of diaphragmatic or intercostal paralysis on the lungs, and through them on the pulmonary circulation and the heart.

This paper is the outcome of observations made on fifteen cases of diphtheritic paralysis in which the muscles of ordinary respiration, especially the diaphragm, became more or less involved. Thirty-four consecutive cases of the disease, treated in the wards of the North-eastern Children's Hospital, furnish thirteen of these. One case, which occurred in 1886, first drew my attention to the subject; the others occurred more recently. They are distributed as follows: One case in 1886, five in 1888, and nine in 1889. I have met with only one doubtful case during the present year, although several patients with diphtheritic paralysis have been under treatment in the hospital.

These figures obviously afford no index of the relative, much less of the absolute, frequency of the complication; but they undoubtedly show that it is not altogether rare.

It is generally met with in "bad" cases—that is, in those in which the paralysis is widely distributed and profound; and this circumstance probably accounts for its being sometimes overlooked, as it is not usually deemed expedient to submit such cases to very searching examination, and the signs of paralysis of the diaphragm and of other respiratory muscles are often but slight deviations from the healthy movements, such as might easily be missed in the presence of more striking or urgent paralysis.

The classical signs of diaphragmatic paralysis are: reversal of the respiratory movements of the epigastrium and hypochondria; dyspnœa on exertion or excitement; diminished force of cough, sneezing, spitting, etc.; and loss of compressive action of the abdominal muscles, difficulty in defecation, etc. (von Ziemssen). The more constant and obtrusive physical signs presented by the cases now under consideration were:

1. Increased movement of the lower ribs, observed in ten out of fourteen cases; not noted in three.

2. Altered movements at the epigastrium during respiration in twelve out of fourteen cases.

3. Altered character of cough and voice. Noted in ten cases, but probably present in all.

These signs are well illustrated by the following cases:

Case I.—Henry H., æt. four years, admitted to the Northeastern Children's Hospital on August 18, 1888.

History: Has never been robust. In the middle of July he suffered from a painful and severe affection of the throat, with enlargement of tonsils and discharge of blood-stained mucus from the mouth. There has been some ulceration of the mouth until a week ago. On August 17th a nasal twang was first noticed, and there was regurgitation of food through the nose. On August 20th he was taken into the garden, but fell over in attempting to pick up something, and complained of his right leg, which was powerless. The right arm became weak on August 22d, and the left leg on the 28th. The parents stated that the house-drains had been out of order for some time, and that two cases of diphtheria had occurred four months before in a neighboring house.

State on admission: Markedly anæmic. Occipital glands enlarged. Great general weakness. Temperature 98.6° F. Pulse 120, irregular and intermittent. Heart in normal position; intermittent action; no murmurs. Respiration normal (*sic*), 16 per minute. Tongue covered with a patchy white fur. Liver and spleen not enlarged. Some scybala felt in hypogastric and left iliac regions. There is general muscular weakness. The soft palate is motionless. The pupils are equal and active.

The superficial reflexes are all present, but the knee-jerks are absent. Some urine, which had to be drawn off by catheter, was normal.

August 30. Heart very irregular and tumultuous last night. (Ordered ext. convallariæ, gr. ½ every two hours, and brandy at the rate of 3 ounces in the twenty-four hours.) The following note was dictated at my visit that afternoon: "There is marked pallor of the integuments and a somewhat earthy tint. Breathing is deep, rather slow, and entirely thoracic. The epigastrium falls in during the deepest inspiration, and no downward movement of the abdominal viscera can be detected. The depression at the epigastrium fills up again during expiration. Diaphragmatic paralysis is apparently complete. All the intercostal muscles seem to act strongly. The heart's action is regular and rapid, with sharp sounds." Is taking liquid food and brandy in sufficient quantity. (Ordered a hypodermic injection of brandy and ether every three hours.)

31*st*. Very restless last night. Breathing labored, alæ nasi acting. Lips and ears dusky. Pulse very small; too rapid to count. Urine contains much albumin and some pale urates. "The epigastric sinking is not quite so obvious to-day, but the abdominal wall is occasionally seen to bulge distinctly during expiration. The expansion of the lower ribs is also rather less than yesterday, and there is a very slight sinking in of the lower intercostal spaces during inspiration. Air enters well into the upper part of the lungs, but very imperfectly along the anterior margins and at the extreme bases. There are no râles. The temperature remains down. Pulse 204."

September 3. Patient is looking rather better, although the temperature has been somewhat raised during the last three days. Pulse 138, full, of good tension, and regular. Breathing still costal, with inspiratory recession of epigastrium. Respiration 36. Air enters well (*sic*). The loss of power in the arms has increased since admission; the child cannot now raise his hands to his head. The grasp is very weak on both sides. The plantar and epigastric reflexes cannot be obtained. The voice is still nasal and indistinct, and the child appears unable to cough. There is constipation since four days. (To have stimulant hypodermics every six hours.)

4*th*. Evening temperature yesterday 100.6°, this morning 99.6°. Yesterday, at 4 P. M., the patient suddenly turned very pale, and the breathing became more rapid (42) and labored, with irregular pulse (144). At the same time the inspiratory recession at the epigastrium became more marked. He was given a stimulant hypodermic, and the daily allowance of brandy was increased to four ounces. Breathing is quieter this morning, but there is still some cardiac irregularity. Tongue is dry and furred.

6*th*. Evening temperature yesterday 101°. Heart's action still irregular and excited; pulse-beats do not correspond to the contractions of the heart. Epigastric recession about the same. Toward evening the temperature rose to 103°, and signs of consolidation, with moist râles, were detected at the right base. The child was now very restless, breathing about 60 per minute, with a pulse of about 170. There was gradually increasing asphyxia during the next few hours, against which free stimulation and artificial respiration availed nothing, and death closed the scene on September 6th.

Necropsy: On opening the chest the heart is uncovered by lung. The diaphragm rises to the level of the third interspace. There are no pleural adhesions. *Right lung:* The whole of the lower lobe is of a

dark-blue color, and entirely devoid of air. The lobules are well seen on the surface. The cut section shows numerous slightly raised patches of broncho-pneumonia, of a lighter color, grouped around the smaller bronchi. The lung tissue is soft and unduly wet. The posterior part of the right upper lobe shows recent pneumonia, contains but little air, and presents a granular section. The rest of the lung is œdematous and crepitant. The *left* lung presents exactly similar changes throughout the lower lobe, though in a somewhat less degree. The upper lobe is œdematous. The heart is firm, but pale, the pericardium healthy. The abdominal viscera appear healthy to the naked eye.

CASE II.—Willie W., æt four years. Admitted October 24, 1889. Five weeks ago he had a bad sore-throat, and was brought to the hospital a week ago because he could not walk.

State on admission: A fair, well-nourished boy; rather fretful. Is unable to stand without support. No ocular paralysis. Voice natural. No trouble in swallowing. Movements of palate rather sluggish. Movements in respiration normal; no evidence of failure of diaphragm. Heart and lungs healthy. Knee-jerks absent; superficial reflexes present.

October 29. There was some difficulty in swallowing liquids yesterday for the first time, and to-day the patient coughs and splutters with each attempt. Palate is quite motionless.

November 2. Some improvement in swallowing. Pulse 96, of good quality. Temperature subnormal.

6*th*. There is a faint internal squint in the right eye, and the lateral movements of the eyeballs are limited. Voice distinctly nasal since two or three days. The child very rarely speaks. Is still able to swallow slowly and with much care. The movements of the lower ribs are somewhat excessive, and the abdomen only moves slightly during respiration. The epigastrium, however, still bulges occasionally during inspiration.

8*th*. To-day there is a slight but undoubted bulging of the epigastrium during expiration. There is no duskiness of face or lips. Cough is rather troublesome, especially after swallowing, but still retains its explosive character.

9*th*. The abnormal movements are rather more accentuated to-day, and the cough is decidedly less forcible. Pulse 88, of fair strength, but rather irregular. A few rhonchi are heard over the lungs. Air enters freely into every part. Was ordered to be fed by nasal tube, and to have artificial respiration performed for ten minutes three times a day.

11*th*. No obvious change in patient's condition. The expiratory bulging of the abdomen is a little more marked, and there is distinct recession of the abdominal wall during inspiration.

12*th*. General condition rather improved. The movements of the lower ribs are very obvious, and distinctly excessive, when compared with those of a child in an adjacent cot. Expansion is more obvious than elevation.

14*th*. Last night the child became restless and paler, and the breathing slower. This morning he is quieter, and the lips have regained a better color. He can now scarcely move his head from side to side. Yesterday the arms became weak, and their movements incoördinate. Breathing is still entirely thoracic. Respirations 24 per minute, long and

sighing. No physical signs at the bases. Pulse 124, full, but very compressible. (Artificial respiration for ten minutes every six hours.)

15*th*. At 11 A. M. the child suddenly vomited, the face became dusky, respiration came in gasps, and the pulse became extremely weak and running, A hypodermic of ether was immediately given, and artificial respiration performed. The color improved a little, but the patient did not properly rally. He vomited again at 2 P. M. Faint bronchial breathing was now made out over the bases, but soon became obscured by copious moist râles. At 4 P. M. he was slightly livid, and sweating profusely. There was gasping respiration, with very excessive movement of the lower ribs. During inspiration the epigastrium was sucked in under the ribs, and flapped outward during expiration. There was also slight inspiratory recession of the lower interspaces. Death occurred at 4.15 P. M. The temperature never exceeded 99°.

A post-mortem was not allowed.

CASE III.—William B., æt. four and a half years. Admitted September 11, 1888.

History: Had diphtheria six weeks ago. Three weeks after the onset there was regurgitation of fluids through the nose, and during the last four days he has been weak on his legs.

State on admission: Pale, well-nourished. There is general muscular weakness, with tottering, uncertain gait. Both hand grasps are feeble. The voice is nasal. The soft palate does not move during phonation, and flaps backward and forward during respiration. There is no ocular paralysis. The knee-jerks are absent, the superficial reflexes present. The heart's action is regular, the pulse good. The respiratory movements are those of health.

September 14. Voice more nasal and weaker. Pulse 120, slightly irregular. Temperature normal. Breathing 18, sighing in character. Swallowing is effected with more difficulty, and occasions attacks of coughing. The movements of the lower ribs appear to be increased in both directions. The inspiratory filling in of the epigastrium is not so marked as on admission, and the descent of the diaphragm feels less forcible. (To have artificial respiration for fifteen minutes once each day.)

17*th*. There is slight percussion dulness over both pulmonary bases, with weak breath-sounds and occasional large moist râles. Beyond this the patient's condition is not appreciably changed. Pulse 120, of fair tension, and a trifle irregular at intervals.

24*th*. The movements of the lower ribs are much increased. No downward movement of viscera during inspiration can be made out at the epigastrium. The diaphragm appears to be deeply involved. Cough is more troublesome, especially after drinking. At the right base there is deficient resonance, with very weak breath-sounds and bronchial expiration. Vocal resonance is not appreciably modified. On deep breathing a few moist râles are audible. Air enters the left base freely. Pulse 114, of good quality. Temperature varies between 98° and 99.2°. (Artificial respiration to be performed twice a day for fifteen minutes.)

25*th*. The epigastrium does not move during respiration. The abdominal note is obtained as high as the sixth rib in the right nipple line, the lung note being recognized as low as the fourth rib. Air enters very imperfectly into this lung; breath sounds very feeble at right scapular

angle. The cough has quite lost its explosive character. (To be placed on his left side, and to have artificial respiration three times a day.)

28*th*. Condition much the same. There is profound anæmia, but, on the whole, the general aspect of the child is somewhat better. To-day the breathing is essentially upper costal. The epigastrium is still motionless. The cough is a little stronger, but still lacks suddenness. Air enters the right base decidedly better, but there is still some evidence of collapse. The temperature remains down. The general muscular weakness is much the same.

29*th*. Patient speaks better to-day, especially in articulating the explosive consonants. The palate moves distinctly in phonation.

October 1. There is slight (normal) movement of the epigastrium to-day. The right base continues to clear up.

2*d*. Liver dulness from fifth to seventh spaces in nipple line. Swallows without coughing since yesterday.

5*th*. Respiratory movements of lower part of chest are gaining in amplitude, but the breathing is still mainly upper costal. Pulse 90, of good quality. There is marked general improvement.

7*th*. Liver dulness reaches to margin of ribs in the nipple line; edge felt during deep inspiration. Paralysis of limbs is passing off perceptibly.

16*th*. Is putting on weight rapidly. Diaphragm now acts normally. Artificial respiration omitted two or three days ago.

24*th*. Sits up in bed, but is still unable to stand. Knee-jerks still absent.

November 1. Discharged convalescent.

CASE IV.—Percy S., æt. two years. Admitted August 12, 1889.

History: Had diphtheria five weeks ago. Recovered in a fortnight; remained weak. Ten days ago he lost the power of walking, and during the last eight days his voice has become altered in quality.

State on admission: Fair color, well nourished. No obvious ocular paralysis. Cry distinctly nasal. Palate and uvula quite motionless. Often coughs after drinking. No regurgitation of liquids through nose. Can move his legs about, but is unable to stand. Knee-jerks absent. Superficial reflexes feeble. Urine free from albumin. Rhonchi and scattered moist râles over lungs. Heart acting normally. Temperature 98.6°.

August 14. Cough troublesome. Is fed entirely by nasal tube.

16*th*. Last night, after a severe attack of coughing, the child began to breathe hurriedly and the surface became rather dusky. On examination the diaphragm was contracting, but the movements of the lower ribs in front appeared excessive. The temperature had risen to 101.2°. The distress passed off after a subcutaneous injection of brandy. Temperature this morning 102.8°. At 7 A. M. the child was sick after being fed, and rapidly became cold and blue. The diaphragm was now found to be inactive. Artificial respiration for fifteen minutes caused a marked improvement in the child's condition, and half an hour later all signs of distress had subsided; but the abdominal wall remained entirely passive excepting a trifling fulness of the epigastrium during expiration. The movement of the lower ribs was much increased. Evening temperature 102.6°. Chest not examined.

19*th*. Child doing well. Pulse 132. Temperature has fallen to normal. Artificial respiration has been systematically performed every six

hours since the 16th with good results. The chest moves well. The abdomen is still motionless. There are no signs of pulmonary collapse or of broncho-pneumonia. Feeding is still entirely by the nasal tube.

20*th*. Yesterday afternoon the diaphragm began to act slightly. (Artificial respiration omitted.) He still coughs and splutters on attempting to swallow liquids.

24*th*. The movements of the abdomen are now fairly good, but still less than they should be. There is a marked general improvement. The cough has a more natural ring about it, and the voice is clearer.

29*th*. Improvement continues. Cough quite natural. No signs of diaphragmatic weakness remain, and the action of the lower ribs is normal.

September 7. Child now sits up in bed, but cannot yet stand. Discharged convalescent on the 11th.

CASE V.—Alfred E., æt. two years and four months. Admitted September 18, 1889.

History: About seven weeks ago he had a yellow discharge from the nose, and at about the same time the voice acquired a nasal character and fluids regurgitated through the nose after drinking. There is no history of sore-throat.

State on admission: The child is in a very prostrate condition, and makes no attempt to move in bed. The face is pale and a trifle dusky. There is a slight horizontal nystagmus, but no ocular paralysis. There is a very slight right facial paralysis. The chest moves well in respiration, and the movements of the lower ribs are not obviously increased. The abdominal walls are blown outward during expiration, and the diaphragm appears to be quite passive. There is an occasional non-explosive cough. The knee-jerks are wanting, and the abdominal reflexes are also in abeyance. There are moist râles all over the lungs, with a tendency to bronchial breathing at the left apex; no percussion dulness. Respiration 24. Pulse 128. Temperature 101.2°.

September 23. There has been no decided change in the child's condition. The temperature has been slightly above normal on one or two occasions only. The râles are more numerous over the right side of the chest. This morning the breathing became more embarrassed, and the movements of the lower ribs distinctly exaggerated. During the day the child grew more restless as the signs of asphyxia gradually increased. Artificial respiration was of no avail. Death occurred on September 24th.

Necropsy: There are no pleural adhesions on either side. The posterior portion of the right lung is extensively collapsed, the lower lobe being affected almost in its entirety. Portions of the collapsed lung sink in water. The left lung is in a precisely similar condition. The cardiac valves are healthy. There is slight distention of the right auricle. The liver and kidneys are congested.

Want of space prevents a more detailed narrative of these cases, but I may add that the whole series conformed very closely to one type. Paralysis of the palate and pharynx was present in every case, and tube-feeding was frequently rendered necessary by the difficulty of swallowing and the leakage of food into the air-passages. Obvious paralysis of the lower limbs was the rule, and in some the arms also became

affected. The knee-jerks were absent in every case. In a few the muscles of the back and neck were unmistakably involved, but in others how far the weakness observed was due to actual paralysis or was simply the expression of extreme general debility was not made out.

The children were all markedly anæmic, and a dusky or earthy tint was observable in some of the more severe cases. They lay for the most part quite still in their cots, without exhibiting any signs of pain or distress. The way in which they spared their breath was very striking. In the worst cases it was impossible to get a word from them, though they would generally express assent or dissent by a nod of the head. The breathing was usually slow, sometimes sighing in character, but not labored; but after cough or other exertion signs of dyspnœa often became apparent. A short, non-explosive, ineffectual cough was also a common feature in these patients. Wherever secondary changes occurred in the lungs, such as extensive collapse or broncho-pneumonia, or when sudden cardiac failure supervened, the symptoms of these conditions naturally modified to a considerable extent the general aspect of the case. It should be added that none of the patients had been tracheotomized.

Increased movement of the lower ribs has been one of the earliest as well as one of the physical signs most constantly associated with diaphragmatic failure. It varies within wide limits, both in amplitude and duration, becoming more obtrusive when the respiratory efforts are violent, and diminishing to a considerable extent during quiet breathing. As a rule, this overaction has been most obvious where other signs of diaphragmatic paralysis were well marked, and has invariably disappeared when the diaphragm resumed work. Its character may be modified to some extent by the presence and degree of paralysis of the abdominal and intercostal muscles, but, apart from this, it is simply an exaggeration of the healthy movements. The resulting expansion of the lower portion of the thoracic cage is all the more striking, that during the same period the epigastrium is either passive or actually receding, a state of things the exact reverse of what obtains in the dyspnœa of broncho-pneumonia and collapse, to which these cases sometimes present a superficial resemblance. The phenomenon appears to be due to a compensating over-action of the scaleni and intercostals, which is intensified by the diminution or removal of the steadying action of the diaphragm on the lower ribs. It is of especial value, because by its early appearance it gives timely warning of approaching danger.

The nature of the altered abdominal movements is so clearly illustrated by the cases quoted above, that it does not call for any lengthy notice in this place. A diminution in the extent of normal movement should always arouse suspicion, and, in my opinion, cessation of movement, short of reversal, is already an indication of paresis of the diaphragm. Valuable information may also be obtained by laying the

hand lightly on the epigastrium, any marked diminution or cessation of inspiratory filling-out of this region being readily appreciable in this way, particularly if the manœuvre is repeated in routine fashion at each visit.

The cough is always modified to some extent, at first becoming simply weaker, but eventually losing altogether its explosive quality (in severe cases), so that the patient is quite unable to expel any secretion or foreign body from the bronchi. Concurrently the voice becomes progressively feebler and aphonic. Strictly speaking, it is incorrect to attribute feebleness of expiration and of the associated reflex acts, cough, spitting, and sneezing, to paralysis of the diaphragm, since in all these it is relaxed. It affects them only by causing the preceding inspiration to be incomplete. But, over and above this, it is highly probable that weakness of the muscles controlling the glottic aperture is an important factor in the causation of these phenomena. The troublesome attacks so frequently observed after drinking are also to be attributed in part to the same cause, and in part to the enfeeblement and incoördination of the muscles of deglutition.

Having drawn attention to the nature of the physical signs indicating partial or complete paralysis of the diaphragm, it behooves us to consider what, if any, changes occur concurrently in the lungs, and what evidence can be adduced in support of their dependence on the paralysis of the diaphragm.

In fourteen out of fifteen cases there was some evidence of disturbed function of the lungs. But the notes of some of them are, unfortunately, so incomplete in this direction that it is impossible to estimate, with any approach to accuracy, the full significance and relative frequency of the several signs observed.

Weak breathing over the bases was noted in five cases.

Bronchial or tubular breathing in six cases, with or without elevation of temperature.

Percussion dulness in four cases.

Moist râles over the backs in nine cases.

In other words, there was evidence in a majority of the cases of imperfect entrance of air into, and of some œdema of the hinder part of the lungs, more especially toward the bases, with condensation or consolidation of the organs in several of them. This state was, no doubt, to some extent aggravated by feebleness of circulation, and by the enforced maintenance of the dorsal decubitus for a prolonged period; but the sequence of events in many cases, quite apart from post-mortem evidence. was always strongly suggestive of a causal relationship between the lung condition and enfeeblement of the diaphragm. This is well illustrated by the cases recorded above.

In Case I., breathing was normal on admission; the heart irregular.

On the third day the diaphragm became paralyzed, and the heart more irregular and tumultuous. On the fourth day there was more dyspnœa, and air was entering imperfectly at the bases of the lungs, but no râles were audible. On the seventh day there was a fresh attack of dyspnœa again, attended by cardiac irregularity, and the signs of diaphragmatic paralysis became accentuated, whilst the temperature began to rise. On the eighth day the dyspnœa was much increased, and consolidation and œdema râles were detected at the right base. Throughout the illness the ribs were expanding freely. After death, on the tenth day, both lower lobes were found completely airless, and studded with patches of broncho-pneumonia.

This patient was not on his back more than ten days, so that decubitus can have had but little to do with the state of his lungs, and it is not easy to see in what way feebleness of the circulation could have induced wholesale pulmonary collapse. It is far more likely that the transient attacks of heart-failure were caused by the more or less sudden collapse of successive portions of the lungs, whilst the sudden aggravation of all the symptoms, with rise of temperature on the eighth day, finds a sufficient explanation in the onset of pneumonia of the right-upper lobe, and patchy pneumonia on the bases. On the other hand, it stands to reason that if the diaphragm fails to descend (contract) efficiently, there will not occur within the chest a sufficient lowering of pressure to overcome the elasticity of the lungs, and admit of their proper expansion, and it is reasonable to suppose that such an effect would be more immediately exerted on that part of the lungs in the neighborhood of which it occurred. This view affords a rational, and, I believe, a true explanation of the manner in which collapse occurs in these cases.

In Case II. the diaphragm became gradually paralyzed on the thirteenth day, but, judging by the incomplete character of the physical signs, the loss of function was only partial, and the over-action of the ribs was apparently able to compensate it. The patient improved somewhat under artificial respiration from the fourteenth to the eighteenth day, although the paralysis of the trunk muscles was still on the increase. On the nineteenth day there was a bad attack of cardiac failure, from which the patient did not rally completely. From this moment there was evidence of total paralysis of the diaphragm, but it was impossible to ascertain whether this event preceded or accompanied the heart disturbance. Shortly afterward weak bronchial breathing was made out over the bases, and rapid œdema of the lungs set in under observation. I have little doubt that in this case also a necropsy would have revealed extensive collapse and œdema of the bases.

Case III. developed diaphragmatic paralysis on the fourth day. Three days later there were signs of œdema and collapse of both bases (relative dulness, weak breathing, and moist râles, without elevation of

temperature), with occasional slight cardiac irregularity. On the fifteenth day the collapse of the right base appeared to be considerable. The abdominal note reached as high as the sixth rib in the nipple line, and the lung note ceased at the fourth rib. He began to improve on the twentieth day. Air began to enter the right base more freely as soon as the diaphragm showed signs of returning activity, and the lower level of the liver dulness simultaneously descended from the sixth rib to the normal level in the course of five or six days. It will be observed that the right lung was chiefly affected, and that from the eighteenth to the twenty-third days the type of breathing was upper costal, the lower ribs gradually resuming work after that date. It is probable that in this case the right half of the diaphragm suffered more than the left, and that the effect on the subjacent lung was intensified and extended by the loss of function of the lower ribs. The ultimate recovery of this patient was, I believe, materially assisted by the systematic performance of artificial respiration.

Case V. was admitted with profound affection of the diaphragm and evidence of marked œdema of the lungs. After death, which occurred on the sixth day after admission, the bases of both lungs were found to be collapsed in almost their whole extent.

Evidence of a similar kind could be obtained from any one of the cases in the series, if it were desirable. But I think the references just made are sufficient to establish relationship between paralysis of the diaphragm and loss of function in the subjacent lung. It is not contended that collapse invariably results, but rather that *the loss of function in the lungs is, cæteris paribus, proportionate to the degree of paralysis of the diaphragm.*

I will now briefly relate two cases which indirectly confirm the view just enunciated, and tend to show that it holds good for other parts of the thorax.

Case VI.—Joseph H. was admitted under my care at the North-eastern Children's Hospital in May, 1886, with well-marked diphtheritic paralysis of the trunk and limbs. On the tenth day some irregularity and increased frequency of pulse were noted. Meanwhile the paralysis was becoming more profound, and the cough was altogether ineffectual and non-explosive. There is no detailed note as to the character of the respiratory movements, except that "the movements of the ribs appeared to grow less day by day."

On the seventeenth day respiration suddenly became embarrassed, and lips and extremities cold and bluish. Examination of the chest showed that the right side was practically immobile, with the exception of the two or three upper ribs. The percussion note was much impaired over the right front and base. At the apex in front the breathing was loud and tubular, weak over the middle lobe and almost inaudible at the base; behind, above the level of the scapular angle, the breath sounds were fairly loud and bronchial. There was no pain of any kind,

and the temperature was not raised more than a degree. On the eighteenth day the child was much weaker; there were impaired resonance and weak tubular breathing, without râles, all over the right front, and exaggerated breathing over the left lung. The heart was not displaced; the backs were not examined. The movement of the right half of the chest was only just appreciable, and the epigastrium receded during each inspiration, whilst it bulged slightly during expiration, and more distinctly so during cough, which was very frequent and ineffectual. The temperature was beginning to rise (100°), the pulse 144, and more thready. During the next two days the child grew worse, and the temperature rose gradually to 102.4°. On the twenty-first day, however, the case began to look more hopeful. The change for the better was rather sudden, and amongst the first favorable indications were a return of movement in the right chest and a rapid disappearance of the signs of diaphragmatic paralysis. Examination of the backs revealed bronchial or tubular breathing over the right apex and posterior apex of the lower lobe, and distant weak breathing at the extreme base of the right side, and exaggerated breathing over the left. On the twenty-fifth day the two sides of the chest moved equally. Three days later, the breathing at the right apex had lost its tubular quality, and from that time recovery was uninterrupted.

Commenting on this case in the *Lancet* (1887), I inclined, somewhat hesitatingly, to the opinion that the lung was in a large measure collapsed, but only hinted at a possible relation to muscular paralysis. Looking back on this case now with the light of subsequent experience, I have little or no hesitation in attributing the physical signs to wholesale collapse of the right lung, induced by the immobility of the right half of the chest and the paralysis of the diaphragm.

It does not seem necessary to invoke the aid of paralysis of the pneumogastric to account for these phenomena. To begin with, it is not very clear in what way paralysis of the bronchial muscles could produce collapse of the lung, although it probably tends to promote œdema by its indirect effects on the local circulation; and, moreover, the occurrence of the physical signs under consideration in those portions of the lungs alone which are subjacent to a paralyzed chest-wall renders it highly improbable that they are dependent on causes acting within the lung itself. On the other hand, the expansion of the lungs is in large measure a purely physical process, and it seems to me that the mechanical defect in the apparatus which must occur as a result of paralysis of the chest-wall adequately explains the changes which have been found.[1]

The second case, to which my attention has been directed quite

[1] It is of interest to note in this connection that in a series of experiments upon animals to determine the effects of section of the phrenic nerves, Drs. Hare and Martin, of Philadelphia, inform me that "the lungs were found collapsed in those cases in which death occurred as the result of section of the phrenic nerves."

recently, is also of great interest. It was communicated to the Clinical Society of London in 1876, by the late Dr. J. Pearson Irvine, under the following suggestive title: "A Case of Diphtheritic Paralysis Simulating Extensive Lung Disease,"[2] of which the following is a brief abstract.

CASE VII.—Y. W., a girl, aged six years, had suffered from symptoms of bronchitis for fourteen days. A brother, aged four years, had died six weeks previously of scarlet fever, and on close inquiry it was subsequently ascertained that both he and the patient herself had had diphtheria at that time. Her illness began rather suddenly with short frequent cough and considerable dyspnœa. She was taken off her feet almost at once. She was feverish the first two or three days, but had suffered no pain.

When first seen she was dull and listless of aspect with a queer look about the eyes, and a drooping head. The temperature was normal, the respirations (14) shallow, slow, but not laborious. She had a continuous cough, as though to clear the throat. There was decided flattening of both infraclavicular regions with almost complete absence of movement. The flattening was extensive and uniform, and it appeared as though the upper part of the chest had fallen in. The bases expanded unusually fully, and there was a strong action of the diaphragm (*sic*). There was marked loss of resonance above and under both clavicles as low as the third ribs, and on each side toward the sternum it terminated at the level of the second ribs in absolute dulness, in what appeared to be an increased area of superficial cardiac dulness. In the supraspinous fossa there was what appeared to be absolute dulness, but the rest of the back was resonant, the bases, indeed, being abnormally so. Every variety of bronchitic râle could be heard. At the apices there were loud sonorous râles not concealing what seemed to be true tubular breathing. There was clear whispering pectoriloquy at both apices.

Four days later she was again brought to the hospital, having been worse in the interval. The chest signs were unchanged, the temperature remained normal. Pulse 60, respirations 14. No distress. The head drooped more, and there was decided left strabismus. The paralysis of the trunk and limbs was also more marked. The speech had become thick and nasal, and on swallowing there was distinct pharyngeal gurgling. The flattening was pointed out to the mother, who at once remarked that the child had been remarkably full chested before the present illness.

She was in much the same state when next seen three days later. A week after this there was a striking change. The head was all but erect, the squint had nearly disappeared, the walk was no longer ataxic, and the child was quite cheerful. The improvement occurred quite suddenly. There was now an increase of resonance below the clavicles, and a distinct diminution of dulness around the cardiac area. The breathing was tubular at the right apex, weak elsewhere, with a complete absence of râles. The upper regions of the thorax still moved imperfectly. A fortnight later she was to all appearance quite cured. There still remained some impairment of movement below the clavicles, but these regions had now become more prominent. The lung gradually invaded the area of increased cardiac dulness, which became reduced to normal dimensions. Tubular breathing below the right clavicle persisted for some time longer.

Commenting on this case Pearson-Irvine makes the following remarks:

"The disease was peculiar in many respects, particularly as regards the bronchial attack, which seemed to be so extensive as judged by physical signs, and yet so unlike in its general symptoms and course to that of an ordinary general catarrh of the tubes . . . All the physical phenomena met with

[1] Clinical Transactions, vol. ix.

at the upper parts of the thorax appear to me to have been due to a paralysis of the muscles concerned in the elevation and expansion of these parts.

"In consequence of this paralysis and the increased action of the diaphragm not only were the apices reduced to the expiratory condition, but even to a condition of temporary collapse, or one allowing accumulation of secretion, so that there were flattening and loss of resonance with tracheal breathing, and also retraction of the edges of the lungs, with consequent increase of the cardiac dulness. And while the symptoms of bronchitis might in part be due to this same cause, I would ask whether a paralysis of the muscles of the bronchial tubes could not better explain this condition. . . . The bronchial symptoms also disappeared suddenly, as if from a sudden recovery of the ataxic muscles, while the changes ascribed to paralysis of the external muscles continued for some time afterward."

This case appears to me strongly to support the view put forward in this paper, for in it the upper portion of the lungs was placed in very much the same circumstances as were the bases in those cases in which the diaphragm was paralyzed; and the condition of the apices, as far at least as can be judged by physical signs, bore a very close resemblance indeed to that revealed post-mortem in Cases I. and V., and which, I believe, was present in varying degree in all the others.

As I have already suggested, the state of imperfect expansion (or of partial or complete collapse) into which the subjacent lung is thrown by paralysis of the chest-wall or diaphragm, is just such a one as to favor the occurrence of local œdema, quite apart from paralysis of bronchial muscles, while the extra work put upon the right side of the heart when the collapse is extensive, is well calculated not only to aggravate the local condition, but to cause œdema to become general throughout the lungs. Such an event is all the more likely to take place in cases like these where the heart is often already weak, and not in a state to bear any additional strain.

To recapitulate, the facts brought forward are held to justify the conclusion that *paralysis of the diaphragm or other parts of the chest-wall tends to induce loss of function in the subjacent lung, which is, cæteris paribus, proportionate to the degree of paralysis, and results in more or less collapse and œdema of the pulmonary tissue.*

It may be objected that the immobility of the chest-wall which is held to be instrumental in producing collapse of the lung is, in reality, a secondary event, a result and not a cause of collapse, just in the way that the chest-wall moves relatively little over a lung which is rendered inactive by consolidation or extensive adhesions. The answer to such an objection is, that, were it true, there should have been diminution of movement, if not actual recession, of the lower ribs in Cases I., III., and V., for instance, in which the pulmonary bases were certainly either collapsed or consolidated, and not a distinct increase of movement, such as was actually observed.

It is not my intention to enter here upon the question of the general treatment of diphtheritic paralysis beyond remarking that the super-

vention of respiratory paralysis renders it more than ever imperative to take every possible precaution to guard against the occurrence of broncho-pneumonia. There are, however, one or two special points which are worthy of notice in this connection.

1. Allusion has already been made to the frequent and ineffectual cough, and to the fact that it is often incited by attempts to swallow. The adoption of tube-feeding has often proved of great value in allaying this distressing and exhausting symptom. It should be put into practice as soon as swallowing is followed by attacks of coughing. A soft red-rubber catheter of suitable size introduced through the nose answers the purpose admirably. The manœuvre is of the simplest, and can be performed by any intelligent nurse, and the children very soon become reconciled to the operation. In addition to relieving cough, and enabling the quantity of food to be regulated to a nicety, this plan has the further advantage of preventing the leakage of food-stuffs into the air-passages, where they act as an irritant which the patient is generally unable to expel, and also tend to favor the occurrence of collapse.

2. I should like to say a word on the systematic employment of artificial respiration in these cases. Possible efficacy of this mode of treatment was first suggested to me by the condition of the lungs in Case I. For if collapse, resulting primarily from physical inability to expand, is the morbid state of lung to be contended against, any rational treatment must have for its object to assist expansion to the utmost. Here, as elsewhere, there is unfortunately the same difficulty in estimating what proportion of improvement is to be attributed to the treatment adopted, and what to the gradual evolution of the disease toward recovery. But I am satisfied that in several cases the ultimate recovery of the patients was materially assisted by the treatment, although in others it appeared to produce no effect, and on two occasions had to be discontinued on account of the discomfort to the patients. It was tried in ten cases, of which five recovered and five died. Until a more extended trial has been made it would be premature to express a decided opinion concerning it, but I have no hesitation in recommending others to try it.

Artificial respiration (Sylvester) should be commenced on the first appearance of any indication of paralysis of the diaphragm, for it should be borne in mind that the object in view is not so much to treat symptoms of asphyxia, etc., as to prevent, if possible, the condition of lung which gives rise to them.

In hospital the treatment is carried out by the nurses three or four times in the twenty-four hours, according to the severity of the symptoms, for a period of ten or fifteen minutes. Great care is always taken to disturb the patients as little as possible, and not to uncover them more than is absolutely necessary.

In conclusion, my best thanks are due to my colleagues, Dr. F. Charlewood Turner and Dr. Armand Semple, for their kindness in allowing me to examine patients under their care, and to make use of their case-notes.

A SERIES OF THIRTY CLINICAL LAPAROTOMIES.

By C. T. Parkes, M.D.,
PROFESSOR OF SURGERY IN RUSH MEDICAL COLLEGE, CHICAGO.

I have found considerable difficulty in arranging the title of this paper, and I do not know that the heading expresses exactly its scope. The method of operating is something of an innovation, in that the laparotomies are done in the public clinic-room, before several hundred students. These cases are presented under the supposition that their care and results may be of interest, and I have gathered all the clinical cases that have come under my control during the past two winter sessions, covering a period of about eighteen months, and operated upon by me at the public clinic of Rush Medical College.

Case I.—M. M., aged twenty-two, American, school-teacher, referred by Dr. Going, family and previous history good, presented herself for treatment with a large tumor of the abdomen. The tumor was first noticed by the patient, a year previous to her coming under my charge, as a small lump in the lower portion of the abdomen on the right side. During the last four months it had increased rapidly until it filled the entire cavity. There was nothing peculiar about it in any way. It was diagnosed as a probable single large ovarian cyst, and operation advised, which was consented to, and done before the class at the College, November 3, 1888. There was nothing found after abdominal section except a large ovarian cyst; no peculiarities, no adhesions. The patient went on to complete and perfect recovery by primary union, without interference or rise of temperature. Discharged cured November 30, 1888.

Case II.—The next operation was done December 1, 1888. Mrs. P. V., aged forty-two; married fifteen years; two children; American; housewife; family and previous history good; referred by Dr. J. G Conley. The patient had been suffering for the past two years; the history was that of an ordinary ovarian cyst, nothing uncommon being determined by examination. Abdominal section and tapping of the cyst showed the contents to be of a chocolate color. It contained sixteen pounds of fluid. There were a number of adhesions to many of the surrounding organs, but these were separated without difficulty and the tumor entirely removed. No well-defined pedicle could be found, the tumor being nourished apparently by its adhesions. In this case no unfavorable symptoms arose in the course of recovery, and she was discharged cured three weeks after the operation.

Case III.—The next operation was done March 26, 1889. Mrs. H. G., aged forty-six; American; housewife; family and previous history good; married twenty-two years; three children. Patient first

noticed the appearance of the tumor six years ago, the first evidence of trouble being pain in the lower portion of the abdomen; and in a few months she discovered a small lump in the right side, which grew rapidly in the last months of its development, accompanied with severe pain. Upon abdominal section the tumor was found to be universally adherent. This was a case requiring the greatest care in the separation of the adhesions from the uterus, broad ligaments, bladder, and all surrounding parts, the operation being necessarily slow and occupying about one hour. Notwithstanding that this was a public operation and one of the most difficult that surgeons meet with, this patient went on to perfect recovery without a rise of temperature beyond 100°.

CASE IV.—Was operated upon April 27, 1889. Mrs. F., aged thirty-five; French; housewife; family history good; referred by Dr. O'Shea. This patient had suffered for many years, and had been under the treatment of many physicians, without relief that was satisfactory. She was relieved by rest in bed, but the moment she assumed the erect position and attempted to do her work the old trouble returned. Upon examination there was easily discovered an enlargement in the neighborhood of the ovary, and an operation was advised. This enlargement was not greater, perhaps, than an orange, but the patient was very fat, and under the circumstances, with the abdominal surface loaded with fat, especially in a patient who had never been pregnant, whose abdominal walls had never been distended, an operation of this kind is attended with many difficulties. This patient went on to perfect and complete recovery without rise of temperature. Discharged cured May 30th.

CASE V.—On May 4, 1889, I had another multilocular ovarian cyst with adhesions. H. K., aged nine years; German; school-girl; family and previous history good; duration of present disease five months. Five months ago a small tumor was noticed in the abdomen. This increased very rapidly, attaining a diameter of eight inches after removal. Its pressure upon the rectum made it very difficult to secure an evacuation of the bowels, the large intestine being filled with masses of fæces at the time of operation.

The abdominal section showed universal adhesions, which were difficult to manage. The patient did well until the third night, when she became restless, got out of bed and sat in a chair, the nurse being asleep. From this time she began to sink, dying from exhaustion on the fifth day. The autopsy showed the wound and the abdominal cavity to be in a perfectly normal condition. Previous to the operation cathartics and enemata had not secured an evacuation of the bowels; this not only increased the difficulty of the operation, but gave the patient more to bear after it.

CASE VI.—The next case was one of papillomatous cyst. Mrs. S., aged thirty-two; American; housewife; family and previous history good. This patient gave a history of having found, six months previous to appearing at the clinic, a small tumor in the abdomen, which did not seem to increase in size, but the abdomen became rapidly distended, so that when she presented herself for examination it was as large as at full term of pregnancy, and full of fluid. No tumor could be found by external examination, but with the history given by the patient of having found a tumor before the abdomen became distended, and by vaginal examination, it was possible upon one side, I think the right, to get a

very indistinct impression, through the fingers, of the presence of some hard substance high above the vaginal roof, and a diagnosis was made of probable ovarian cyst, and an operation advised and consented to. At the abdominal section a large quantity of free fluid was discharged from the abdominal cavity, and as soon as this was emptied there appeared the source of trouble. Here, again, was one of the most difficult cases to be met with under any circumstances. The entire pelvic cavity was occluded by a mass of papillomatous growth, which obscured from view at first the exact position of the uterus and bladder. There was also present in this case something which I have not met before; after the fluid was emptied I felt in the peritoneal cavity a mass of soft material the nature of which I could not distinguish with my finger. Finally, I got it through the opening in the abdominal wall, and pulled out a mass of papillomatous growth as large as my fist, which was attached to the rest by means of a pedicle as large as ordinary twine. How this mass could be nourished through it I could not imagine. Those familiar with these cases know that the surgeon will be able to find somewhere a separation between the cyst wall and the surrounding tissues of the pelvic cavity, and as soon as the fingers get into this opening it will be rather easy to deliver the tumor. Of course, the hemorrhage is pretty free at first, but it is to be remembered that as soon as the separation is completed, no matter how universal the adhesions seem to be, and the base is tied, the bleeding ceases. There were many raw surfaces left after the separation, which were covered as much as possible by fastening together neighboring portions of normal peritoneum with continuous catgut sutures. A glass drain was used. This case, difficult as it was, went on to recovery without any rise of temperature exceeding 100° F. Discharged cured September 27, 1889.

Case VII.—The next case, operated upon August 17, 1889, was a small fibroid in the posterior wall of the uterus, and cystic left ovary. Mrs. B., aged thirty-seven; American; housewife; referred by Dr. Munroe. This case is of no particular interest; there were no difficulties whatever attending this operation, consisting in abdominal section and removal of left ovary; she went on to perfect recovery, and was relieved of the principal symptom of which she complained, severe and periodical attacks of nervousness, which seemingly had not been amenable to treatment of any kind during several years in care of physicians. Discharged cured September 7th.

Case VIII.—The next case is certainly one of interest. The operation was done September 28, 1889. Mrs. I.; American; housewife; forty-three years old; family and previous history good until two years ago.

Oöphorectomy was done for a peculiar kind of epilepsy, which had existed for two years, coming on at every menstrual period, and showing no tendency to manifest itself at any other time. At first the attacks were slight, and hardly noticeable by the patient or her friends, but they so increased until when the patient came to see me at the hospital she had had every operation done upon her that could be done, so far as the external genitalia was concerned, and notwithstanding the fact that she had, apparently, received all the care that physicians ordinarily give to a patient, she still had these convulsions, and they had increased to such a degree that she had as many as ten positive epileptic convulsions in a day. They never came on until menstruation began, and they ceased

with menstruation. I thought in this case there was a very plain indication for causing the cessation of menstruation, if possible, bringing about the menopause as early as could be done. She was advised to have an operation done for the removal of the ovaries and tubes, and this was performed. The stitches were removed on the seventh day. She had no trouble from the operation. She stayed in the hospital for three months, and during that time she had a slight convulsion on the second return of the period of menstruation. On the third return she had three convulsions, which were rather severe, the first day of menstruation. Between that and the next return of menstruation she went home. I have received letters every month from the husband. She has had no convulsions whatever, but the occurrence of the convulsions is supplanted by increased nervousness and restlessness at the time of menstruation. But the husband says in his last letter that this has begun to subside.

CASE IX.—Mrs. S.; forty-five; previous and family history good. Five years ago patient noticed a small lump in the lower part of the abdomen, which increased very slowly in size until four months ago, since which time it has grown rapidly. Menstruation has been irregular, and entirely absent for four months.

The pedicle was very broad and short. The first ligature did not entirely control the hæmorrhage, so a second one had to be applied. The patient recovered normally, being discharged three weeks after the operation.

CASE X.—The next case was a small twelve-pound ovarian cyst, operation done October 15th.

There was nothing unusual about it in any way, the patient's recovery being normal and perfect throughout, without rise of temperature.

CASE XI.—On October 19, 1889, another interesting case was operated upon. A. M., aged nineteen; family and previous history good; duration of present disease four years.

The patient presented herself with an extensively distended abdomen, and with this history: Four years ago she began to have some abdominal distention, which went on rapidly for a year, when she was tapped, and thirty-two pints of fluid withdrawn. It filled up again in the course of the next year with the same amount of fluid, and the same in the third year, and finally in the fourth year she came under my care, and I decided to do an operation for removal of the cyst. In making the vaginal examination in this case I could feel through the roof of the vagina a hard substance of some kind, which ran obliquely across the pelvis, from right to left, just as though a lead pencil were placed across; so I concluded that the case was one of dermoid cyst, containing bone. The tumor with contents weighed forty pounds. The patient went on to complete recovery. The tumor displays the superior maxillary bone, the nasal bone, and part of the frontal and malar bones; and in part of the upper jaw tissue one is able to discover teeth. The tumor is interesting because of the mass of bone tissue found within it. The patient was discharged perfectly well November 12, 1889.

CASE XII.—The next case was one of ruptured papillomatous ovarian cyst; operation done December 9, 1889.

There was nothing about it of special interest, except, perhaps, that there were so many adhesions and raw surfaces left in the pelvis and abdominal cavity that I deemed it proper to use a drainage tube. The

patient was discharged January 13, 1890. Three months later she is reported as having some evidence of return of disease.

CASE XIII.—The next case was an ovarian cyst; nothing noticeable in connection with it; operation February 8, 1890. M. F.; aged twenty-four; family history good, except that father died after an operation for the removal of a tumor, and a sister died of tuberculosis. Previous history good.

Ovariotomy was done very quickly, the entire operation lasting twelve minutes. This girl presented herself with a cyst, which we found subsequently contained thirty pounds of fluid, but so far as the girl's appearance went there was nothing to call attention to her as being diseased or sick in any way. It has been proven to me on several occasions that when the general health is not affected by the tumor it will not have many adhesions; but when the patient is emaciated, and the general health suffers, there will be adhesions. Discharged March 14, 1890, cured, not having had an unfavorable symptom.

CASE XIV.—The next case was a small ovarian cyst of right ovary and inflamed left tube.

The operation was done March 11, 1890, and she went on to recovery without difficulty. Discharged cured, April 5, 1890.

CASE XV.—The last ovariotomy was for a cyst of the broad ligament, containing eighteen pints of fluid. Mrs. W. H. D.; aged sixty-one; family history of tuberculosis and carcinoma; previous history good; duration of present disease two years.

Tumor was at first very slow in growth, but during the last five months very rapid. The tumor was peeled out of the broad ligament as an entire cyst, the edge of the broad ligament being tied and dropped. The patient has gone on from the day of operation until the present time without any interference whatever—in fact, says that she feels much better since the operation than before. Note: Discharged cured, April 15th.

CASE XVI.—The next operation was done April 16, 1889. It was a case of ectopic pregnancy. The patient, Mrs. H., who was referred to me by Dr. O'Shea, of this city, was twenty-six years old, and had one living child, eight years old, and three miscarriages. Three months before coming to me she supposed herself to be pregnant; she had missed a term, and in the interval before the second time of menstruation she was seized with severe pains in the pelvis, had symptoms of shock and prostration, and a bloody vaginal discharge. A physician saw her, and detected on vaginal examination a mass on the left side of the uterus, with a considerable swelling projecting up into the abdominal cavity. In a few days she was again seized with the same colicky pain in the pelvis, and again had a bloody vaginal discharge. She was brought to the hospital and placed under my care, and I diagnosed ectopic pregnancy. An operation was done for its relief, before the class. The abdomen was opened and the ruptured tube discovered. After the removal of great masses of blood, the tube and sac were opened freely; no fœtus was found, but parts of the placental tissue were found, removed, and examined. In this case I thought it was too hazardous to attempt the removal of the Fallopian tube; so the opening that was made in it was stitched into the edges of the abdominal wound, and then all the accumulated blood was scooped out of the cavity by the fingers and other means, and the cavity filled with iodoform gauze. At

intervals of two or three days, portions of the gauze were removed until the cavity finally shrivelled up and closed. The woman left the hospital well, and remained well.

Case XVII.—The next operation was done March 4, 1890. Mrs. S. J., forty years old; previous history good. Referred by Dr. Palmer. The history is similar in the development of evidences of pregnancy and the commencement of symptoms of rupture and the time of operation. In both of these cases there had been a long interval between the last pregnancy and the occurrence of this supposed pregnancy, in the first case eight years and in the last case nine years. This is an important factor in these cases; I think Mr. Tait insists that it is one of the principal signs to be remembered. In many of these cases there is this history of a long period of years between pregnancies, then the cessation of menstruation, then comes the history at the end of two months of severe colicky pain in the lower portion of the abdomen, this extreme pain causing shock and prostration, all the evidence of blood-loss and vaginal discharge, and in many cases the discharge through the vagina of the decidua; as in this case, the patient told me that pieces of skin were discharged through the vagina. There were found in the abdominal cavity large masses of blood filling up the pelvis. The Fallopian tube upon that side was ten times its normal size, with an opening through which protruded large clots of blood. These were all cleaned out, and a ligature thrown around the Fallopian tube between the sac and the uterus, and the tube removed. In this case, as I had cleaned everything out and then removed the sac, there was nothing to sew to the abdominal walls. Here was a large cavity with little particles of blood that I was afraid to leave inside by closing the abdominal wound, so I filled the cavity with iodoform gauze and let the intestines come down against it and sewed up the wound above the gauze. This gauze was left in several days without any disturbance, because the patient showed no reason why there should be any disturbance of it; then we commenced to pull the gauze away; every day a piece was removed, and it kept perfectly sweet and clean. The abdominal wound is healed, and the patient was discharged cured on April 26, 1890.

Case XVIII.—Mrs. A. L., aged thirty-three; family history good; previous history good until date of marriage, twelve years ago. Referred by Dr. Munroe. Operated on June 8, 1889, for pyosalpinx. Discharged September 3, 1889.

Case XIX.—Operation, September 28, 1889; discharged November, 1889. Mrs. H., aged twenty-five; family history tubercular; previous history good until one year ago. Referred by Dr. Knox. The disease commenced with severe pain in the lower part of the abdomen. A swelling appeared in this region, evacuating a large amount of pus through the bowels, which had been repeated several times. There was a resonant tumor in the right iliac region, just above Poupart's ligament. Abdominal section disclosed a right pyosalpinx with universal adhesions. The sac could not be drawn up into the abdominal incision. An opening was made into the abscess from the vagina by means of a pair of long curved scissors, guided by the hand in the abdominal cavity, and a rubber drain was introduced. In doing this, the bladder was wounded. The abscess drained nicely; the wound of the bladder healed under the use of a retention catheter for one week. The abdominal wound healed normally.

CASE XX.—Operation, January 7, 1890. Mrs. S., aged forty-four; three children; family and previous history fair. Seven months ago, first felt tenderness in the lower portion of the abdomen; a month later, first noticed some swelling. Patient was treated in Cook County Hospital for three months; lost much flesh, became very weak, had febrile attacks, the evening temperature reaching 101°. Incision in the median line, aspiration of eight ounces of pus, sewing of sac to abdominal wall, free opening of sac, introduction of drainage-tube and iodoform-gauze tampon. Abdominal wound healed and the abscess cavity drained well, a sinus containing a drainage-tube and discharging a small amount of pus still persisting.

I do not know that much need be written about these three cases; they were all pyosalpinx and pelvic abscesses, and all recovered. I imagine that anyone who has much laparotomy work to do will bear me out in saying that these cases of pelvic abscess very frequently present difficulties that are troublesome to overcome, even in an ordinary operating-room, surrounded only by assistants, because they are so apt to be surrounded by adhesions. These cases presented no particular difficulties, except in two of them, from an old opening into the rectum there had come, in one on the right and in the other on the left side, a tumor, circumscribed in character, well out toward the ileum, in one case below Poupart's ligament and in the other above, which was tympanitic, crackling under pressure of the finger, showing the presence of gas, yet not enough pus in their formation to cause them to come to the surface and ulcerate through. In both cases laparotomy was done. The third case was peculiar in that it showed a disposition to go above the pelvis toward the abdominal walls. The woman had been in several hospitals, and I had decided that, notwithstanding it was high up, with its acute course, tenderness, and peculiar feel, there was pus in it, and I advised her to have abdominal section done to find out, and we did find it. The cyst wall was fastened to the abdominal wall, and the cavity packed with iodoform gauze. She recovered without difficulty.

CASE XXI.—The next case was a cyst of the pancreas. Mrs. W. E. S., aged twenty-four; family and previous history good. The operation was done December 11th. Four years ago this patient noticed a small, round tumor in the neighborhood of the pancreas. It did not show much disposition to increase in size, at first. Two years ago, she became pregnant, and during the pregnancy it did not show any disposition to grow; but after delivery it grew rapidly, so that when she presented herself the upper half of the abdominal cavity was filled with a fluctuating tumor. It could be differentiated as belonging to this portion of the abdominal cavity because the resonance was all below, and it could be diagnosed as a post-peritoneal growth, from the fact that, here and there, by careful percussion over the surface, circumscribed resonance could be determined, marking the course of the intestines between the abdominal walls and the tumor. It was diagnosed to be a pancreatic cyst, partly from the history and partly from the examina-

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CASE XXI.—The next case was a cyst of the pancreas. Mrs. W. E. S., aged twenty-four; family and previous history good. The operation was done December 11th. Four years ago this patient noticed a small, round tumor in the neighborhood of the pancreas. It did not show much disposition to increase in size, at first. Two years ago, she became pregnant, and during the pregnancy it did not show any disposition to grow; but after delivery it grew rapidly, so that when she presented herself the upper half of the abdominal cavity was filled with a fluctuating tumor. It could be differentiated as belonging to this portion of the abdominal cavity because the resonance was all below, and it could be diagnosed as a post-peritoneal growth, from the fact that, here and there, by careful percussion over the surface, circumscribed resonance could be determined, marking the course of the intestines between the abdominal walls and the tumor. It was diagnosed to be a pancreatic cyst, partly from the history and partly from the examina-

tion. An incision was made through the abdominal walls, and, as soon as the intestines made their appearance the diagnosis was complete. Crossing over the surface of the tumor were many large veins and arteries from the mesentery and the omentum. Now, when I have a doubt about any sort of growth or cyst, especially if its contents are harmful, I carry out the same plan as carried out with reference to abdominal abscesses—*i. e.*, to shut off the peritoneal cavity first, so it will not be affected by anything that comes out of the cyst. The cyst wall was fastened by sutures to the centre of the incision all the way round. Then the abdominal incision was closed up to this point, and an opening made, and twelve pints of clear, yellowish fluid discharged, which proved to be pancreatic. The cavity was washed out thoroughly, until the fluid came out clear, and then was packed with iodoform gauze, which kept it perfectly aseptic. This gauze was removed from day to day, the cyst wall shrivelled up, and the cavity disappeared, and the patient was cured at the end of two months. She has since remained well.

Case XXII.—Mr. J. G. K., aged thirty-two; family and previous history good. Referred by Dr. Collins. Male patients represent my point as well as do female patients—*i. e.*, the doing of these operations before large assemblies. This was a large papilloma of the kidney. He came to us with a greatly distended abdomen upon the right side, with the history of a growth commencing posteriorly just below the ribs and extending downward to the ilium. It seemed to fluctuate, and was very elastic. An incision was made, to uncover it, and according to the methods I have already described. The post-peritoneal covering was stitched to the abdominal edges, and an opening was made into the mass. It was found not to be fluid, but to be a mass of papillomatous degeneration connected with the kidney. If there ever was a case which demonstrated the beneficial effects of this manner of treating large cavities and keeping them from septic trouble, this was the case. Nothing could be more likely to take upon itself septic action. This large cavity was filled to overflowing with iodoform gauze, and there never was any septic trouble, the cavity filling up quickly and the gauze being removed as it filled up. The patient recovered entirely from the operation, and was discharged after three months, a sinus remaining.

Case XXIII.—Mrs. B., aged twenty-six; mother of two healthy children; family and previous history good.

This woman came to me with a tumor of the left kidney as large as a cocoanut. The diagnosis was made; its position determined by the rules we carry out in these cases. It proved to be an adenoma of the left kidney. It is interesting as showing that the mass of kidney had been thinned out, and that the cavity is filled up with the tumor. This tumor was removed by the anterior incision opening carefully into the peritoneal cavity, making an incision in the posterior peritoneum to the outer side of and in the course of the descending colon, carrying the colon over to the right, exposing the kidney and removing it, making drainage through the posterior wall by passing scissors through the interval between the last rib and ilium. This woman was four months pregnant when this operation was done, but it caused no trouble, and she went on to full term and was delivered of a healthy child and recovered. Patient discharged cured at the end of eight weeks, and was able to do her own housework.

CASE XXIV.—Mrs. F., aged forty; family and previous history good. Referred by Dr. Bryan. It was a large uterine myoma, which makes up another of the deaths in this series, but one which probably could have been avoided. Patient died May 30th, of intestinal obstruction without inflammation.

CASE XXV.—The next case, an epithelioma of the uterus, was removed by vaginal hysterectomy; operation September 24, 1889. Mrs. H., aged forty-four; one child; family and previous history good; duration of disease, one year.

There is nothing particularly interesting in this case, except that profuse hemorrhage occurred some six hours after the operation during a fit of vomiting, and when I came to examine her I found upon the left side the tissues at the base of the forceps had pulled out and left the uterine artery free. By the use of tampons the hemorrhage was stopped and never recurred, and the patient went on to recovery. Patient discharged cured October 12, 1889.

The next cases I pass by without much reference: one a cancer of the stomach, the other of the liver and mesentery. In the first case laparotomy was done for the purpose of relieving the patient, if possible, by establishing an anastomosis between the stomach and the seat of the trouble. In the other case operation was done for the removal of a very painful carcinomatous nodule at the umbilicus. It may be well for me to say that cases of development presenting a very hard, tense, somewhat circumscribed mass, embracing the umbilicus and surrounding tissue of the abdominal walls to a slight degree, accompanied by extreme emaciation pointing to severe and troublesome disease, will almost always indicate the presence of carcinomatous disease affecting the liver.

CASE XXVI.—Operation April 2d, died April 3d. Mr. S., aged fifty-three; carpenter; family history excellent; previous history, many years dyspepsia. Present symptoms those of carcinoma occluding pylorus; patient extremely emaciated, not having taken nourishment by mouth for weeks. Operation gastro-enterostomy. Patient died twenty-four hours after the operation from exhaustion.

CASE XXVII.—January 22, 1890. John R., aged fifty years; American; farmer; family and previous history good. Duration of disease, five months. Wound healed normally.

CASE XXVIII.—Operation October 12, 1889. Died suddenly, probably of thrombosis of pulmonary artery; autopsy not permitted. Mrs. B., aged fifty-one; family and previous history good until a year ago. Referred by Dr. Adolphus.

CASE XXIX.—Operation March 8, 1890. Mr. A. R., aged twenty-nine; family and previous history good. Referred by Dr. Bridge. Duration of disease, ten months.

Has suffered pain and tenderness in the ileo-cæcal region ten months. During this time he has had three attacks, characterized by severe pain, high fever, and increased induration in the affected region. Last attack came on three weeks ago. Treatment: incision over cæcum four inches long into the abdominal cavity. Numerous adhesions were found

between folds of intestine. A large piece of omentum, hard and contracted by inflammation, found adherent to the cæcum and abdominal walls, was ligated and removed. The cæcum was adherent throughout to the iliac fossa; the appendix could not be found. Recovery perfectly normal. Patient discharged cured April 2d.

CASE XXX.—Mr. J. L., aged forty; family history bad; previous history good; duration of present disease, several months.

The last case is one in which I did laparotomy for the purpose of relieving a distended abdomen, which examination showed to be filled with fluid. By displacing this fluid, by pretty firm pressure of the hand in different directions, it was possible to determine some nodulated masses here and there in the peritoneal cavity. Diagnosis was made of tubercular degeneration of the peritoneum, and abdominal section done for the purpose of establishing drainage and taking off the pressure from the organs, and possibly leading to the recovery reported in such cases. An operation was done and the cavity of the peritoneum found full of fluid, and the peritoneum and abdominal walls covered with nodules in all directions, the omentum rolled up into wads and these filled with tubercular nodules. Drainage was used, and the patient recovered from the operation without difficulty.[1]

This presents a series of thirty cases. Of these, fifteen were ovarian, and out of the fifteen but one death. Two were extra-uterine pregnancies; both recovered. Three, pyosalpinx; recovered. One cyst of the pancreas; recovered. Two, disease of the kidney: one complete removal of the kidney, the other partial removal; both recovered. Two, disease of the uterus: one cancer with perfect recovery, one large myoma with death. Three cases of carcinoma: one of the stomach, death; two of the liver and other organs—one recovery and one death. Appendicitis, one case, one recovery: tuberculosis of the peritoneum, one case, one recovery.

Thirty similar cases in a public clinic, with twenty-six recoveries and four deaths, is a record that is rarely exceeded.

So far as ovarian tumors are concerned, the removal of a simple ovarian tumor is about the simplest operation a surgeon can do. But what I wish to call attention to principally is the fact that in different cities a great proportion of the large amounts of money that are given for hospital purposes has been expended in putting up special rooms for laparotomies, so arranged that it is impossible for microbes to get in or out. In some places the patient is as absolutely isolated as is a case of smallpox. Physicians who see the case are let in in small squads, a few at a time, into these specially prepared rooms, and this is done under the impression that something other than attention to the immediate surroundings of the patient must be done in order that the success of the operation shall be assured. But I contend that is useless; I do not believe any patient's life was ever saved by marble walls or tessellated

[1] Died about six weeks later from exhaustion.

pavements. My own belief, which I have put in force so far as these thirty cases were concerned—cases that were taken without selection, and that represented the moderately difficult and the severely difficult—is, that it is what is put into the abdomen which causes trouble, and also that it is the preparation of the operator and of his assistants, and of everything that touches the patient about the wound, from which safety comes.

It is my rule, from which I seldom depart, to have the patient under my close inspection and control three days before the operation, and during that time I try to disinfect the intestinal tract as possibly a source of self-infection. The patient is given freely of cathartics, and the intestines are emptied entirely in every way until the abdomen is as flat as it can be made, and by this means the intestines are kept out of the way during the operation. Every operator knows that when the intestines are full, or distended with gas, it is the most troublesome thing in the world to get them out of the way. The patient is put in bed and kept in bed, and I think that is important. She is given a full bath the first day before going to bed, and when she goes to bed all the hairy surfaces in the region of operation are shaven close, and then a special cleansing given over the abdomen and genitalia; this consists of three or four applications of soap and water, particular attention being paid to the umbilicus. This is very important, and should be done regularly. The line of the incision is washed with ether, and there is applied to the surface of the abdomen the night before the operation a compress of two and a half per cent. solution of carbolic acid covered with an impervious dressing, and this is left on until the abdomen is uncovered for the operation. Not only is that done, but the vagina also is prepared with the bichloride douche, which is followed by one of sterilized water. The vagina is irrigated, not only for the purpose of getting rid of anything that may be a source of infection through the vagina or vulva, but to prepare it for interference if necessary to enter it for any purpose during the operation. The instruments are all specially prepared—I believe in having a large number of instruments at hand, so as to be ready to meet any complication—by being boiled thoroughly in water. I do not think these instruments should be used for all sorts of operations. I have the same assistants, with the exception of the interne, who is always an assistant, about the case, and they are trained in the preparation of themselves, which consists in bathing with soap and water, using nail-brush freely, then with antiseptic solutions, then with soap and water, afterward covering the clothing with a gown so that the clothing is not brought into contact with the patient at the time of operation. The patient is covered with blankets passing about the shoulders and legs, leaving exposed to view only the surface of the abdomen. All these parts are covered with clean dry towels

first, then by towels wet in a two and a half per cent. solution of carbolic acid. I do not believe the wet towels should be brought in contact with the patient's body, as I think it increases the shock. I believe quinine and morphine are of benefit, so all my patients receive five grains of quinine and one-quarter grain of morphine one-half hour before operation.

Adhesions should never be torn or severed until they can be seen. I think a great deal of the bleeding that bothers surgeons comes from the fact that they cannot see what they are doing.

Silk, the sponges, and everything else that is used, should be prepared according to the best rules that are given with reference to making them perfectly aseptic. I never allow an assistant to put his hands or an instrument into the peritoneal cavity unless I direct him to do so. I keep everything out of the peritoneal cavity as far as possible. It is proper for me to say that no antiseptic solutions are ever introduced into the peritoneal cavity, even when pus is present, except sterilized water or a mild solution of boric acid.

A CASE OF GENERAL TUBERCULOSIS IN AN INFANT: PRIMARY INTESTINAL INFECTION.[1]

By WILLIAM P. NORTHRUP, M.D.,
PATHOLOGIST TO THE NEW YORK FOUNDLING ASYLUM.

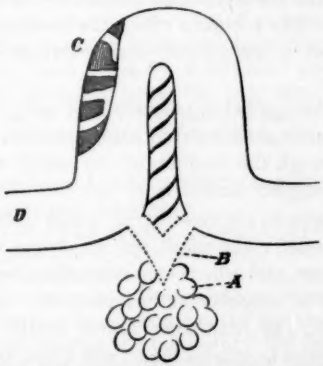
THIS case is of interest because it seems to have arisen from intestinal infection—possibly from "food infection."

History.—The patient was a female child, aged fifteen months. When two hours old it was brought to the New York Foundling Asylum and entered upon the records of the institution as being in "good" condition. It was immediately put out to wet-nurse with a healthy, strong woman, twenty-seven years old, who brought it to the asylum every month for inspection, and the records show that for nine consecutive months it continued to thrive. Three months later, or in the twelfth month of life, it was recorded as being in "poor" condition. Seventeen days before death the child was taken from the nurse because of its miserable appearance, and kept in the hospital. It had a "bad cough," was anæmic, emaciated, and had double suppurative otitis. For the remainder of its life it had a daily average temperature of 101° F., with diarrhœa. Three days before death the passages were frequent, dark, and occasionally contained blood. The temperature reached 104° F. The child died without convulsions. (For this history I am indebted to Dr. George S. Lynde, house physician.)

[1] Presented before the New York Pathological Society, February 26, 1890.

Autopsy.—Body emaciated. Brain and membranes normal. Lungs: the anterior portions contained a few small, glassy, discrete tubercles; the lower and posterior portions were in a condition of recent bronchopneumonia. The bronchial lymph-nodes were many of them enlarged, firm, congested, but contained no cheesy masses and no tubercles. Examination under the microscope showed hyperplasia, no tubercle tissue and no bacilli. The heart was normal. The liver contained small tubercles in moderate number, but itself was not enlarged. The spleen was small and contained a number of small, discrete miliary tubercles. The kidneys had each upon surface and on section from three to five distinct small miliary tubercles. The stomach was slightly congested, empty, and relaxed.

Intestines: opposite the middle of the ileum, within the mesentery, were eight to ten large lymph-nodes, closely grouped together; these were cheesy and had diffluent centres. The mesentery was somewhat shortened and thickened at this point, and the intestine was sharply doubled on itself forming a knuckle, its contiguous walls being adherent. Two sinuses about two millimetres in diameter, having their openings in the two legs of the knuckle, passed down into the thickened and



Schematic view of knuckle of ileum after contraction of abscess. *A.* Enlarged, tubercular, mesenteric lymph-nodes. *B.* Old sinuses, V-shaped. *C.* Peyer's plaque, ulcerated. *D.* Ileum, middle portion.

contracted mesentery in a V-shape and terminated together in a blind ending. A bent probe could be easily passed into one sinus, dipping down into the mesentery, and made to emerge at the other sinus. In this knuckle of ileum was a single ulcerated Peyer's plaque, the ulcers having characteristic undermined edges. Here, then, in immediate juxtaposition were ulcerated plaque, old sinuses, thick and contracted cicatrix, cheesy and diffluent lymph-nodes. No ulcers were observed in any other part of the ileum, and the enlargement of the mesenteric lymph-nodes, apart from the group just described, was but moderate, and none were cheesy, none tuberculous. The colon was the seat of extensive chronic catarrhal inflammation. Examination under the microscope showed thickening of the mucosa and superficial necrosis of the epithelium. The large mesenteric lymph-nodes near the sinuses were found

under the microscope to be tuberculous, having well-defined tubercle granula with large giant-cells and tubercle bacilli. The only cheesy lymph-nodes of the body were in the mesentery immediately about the cicatrix and old sinuses. The tubercles of the other organs were small, showing no tendency to degeneration, and were presumably recent.

Remarks.—The history is of a sickness lasting six months; wasting, anæmia, cough, severe diarrhœa with bloody passages. The wet-nurse was a strong, healthy woman; she is believed to have suckled the child the first nine months of its existence and then to have fed it. She bore children frequently and was again at this time four months pregnant. It seems probable that her breast-milk was about two weeks old when she took the foundling to nurse. She had borne seven children in seven years; of these four died at birth or soon after; of the three living, one was seven years old and healthy; one was four years old, pale and thin; the other, who was three years old, had Pott's disease of the spine and was wearing a brace. There was no history of any person in the house sick with a cough, and the woman's husband and father were living and said to be healthy. The rooms in which she lived were clean and light, in a large tenement house in the most crowded part of down-town New York.

What, then, was the probable course of the case, looking backward? Tubercle bacilli found their way into the intestine, probably either in infected food or through the medium of the mouth and nose secretions in which were entangled bacilli from the air. From the ileum the bacilli found their way to the mesenteric lymph-nodes and there set up the tuberculous process. The result was an abscess which emptied into the gut by two sinuses, and which, in contracting, brought the gut to a sharp knuckle. The neighboring lymph-nodes became tuberculous, cheesy, and diffluent, and from some source bacilli entered the blood-stream and were borne to other organs, and there set up a similar process. The kidneys, liver, and spleen were moderately affected; the lungs sparingly; the brain and meninges not at all.

REVIEWS.

A Treatise on Orthopædic Surgery. By Edward H. Bradford, M.D., Surgeon to the City Hospital, Boston; Samaritan Hospital, Boston; and Children's Hospital; Instructor in Clinical Surgery, Harvard Medical School; and Robert W. Lovett, M.D., Surgeon to the Samaritan Hospital; Assistant Out-patient Surgeon to the Children's Hospital; Out-patient Surgeon to the Carney Hospital; formerly Assistant Surgeon to the New York Orthopædic Dispensary and Hospital. Illustrated with 789 wood-engravings. New York: William Wood & Co., 1890.

Drs. Bradford and Lovett, both accurate and reliable workers, have had unusual opportunities, not only for considering deformities, but, by reason of their location in Boston, have had exceptional facilities for following up their cases for a series of years. The hospitals with which they are associated being the only ones in Boston devoted especially to this class of cases, their patients have not drifted, as is so frequently the case in many cities, which drifting is so common a source of error in statistics.

The work shows evidence not only of personal experience, but also of wide general knowledge and research.

The first chapter, on Pott's disease, gives a comprehensive and accurate picture of this most dreaded condition, and their treatment of spinal abscess is especially to be commended. In the acute stage of spinal caries, as well as in that of hip disease, they recommend treatment by rest and extension during the acute stage, the patient being placed upon a canvas frame, which permits the removal of the case into the open air without disturbance of the dressings. Fixation by plaster-of-Paris, and other methods, are well shown, and the difficulties of securing rest in the upper portion of the spinal column are fully recognized.

Several forms of head-rest, including a number encircling the neck, which seem advisable to adopt for the purpose, are given.

In regard to operative treatment for the removal of the laminæ for pressure paralysis, the conclusion reached is that "operation, however, has no place in the treatment of Pott's disease until conservative measures have been faithfully tried for a sufficient period of time—measures which, in most cases, will prove efficient and successful in the relief of the paralysis."

Eighty pages are covered by lateral curvatures of the spine. The evil effects of this distortion are well portrayed. Gymnastics, having in view the development of the weakened muscles, form necessarily an important part of treatment, mechanical support being applied judiciously in severe cases.

Hip disease necessarily commands an important position in the book.

The article shows a most careful consideration of the methods of treatment, both by rest, fixation, and traction. The conclusion that it is difficult to summarize the treatment for this malady, for the reason that cases differ greatly in severity, is eminently wise. Too much importance is usually given to the absolute treatment of hip disease by a certain method, or by a certain form of splint, and these authors judiciously make a decided difference in the varied class of cases. In their work they use such methods as may be needed by the indications present. A case in the acute stage differs greatly from one that has passed into a chronic condition. As long as the hip is sensitive, the utmost care should be exercised to arrest the inflammation.

Tubercular articular ostitis of the knee also comes in for a chapter full of thoughtful suggestions. Fixation, protection, and rest are the essential conditions of treatment.

Various forms of club-foot, and a few of the innumerable varieties of apparatus, are discussed. Operative treatment receives its full share of attention, as without operation the correction of talipes is slow and tedious.

In congenital dislocation of the hip it is recommended, by long-continued rest and traction, followed by the use of apparatus, that an attempt be made to limit the mobility of the head of the femur.

Infantile spinal paralysis and cerebral paralysis in children very properly receive full consideration, as they are among the most disabling deformities; and we are glad to see that tenotomy is advised, not only for spinal paralysis, but also in cerebral palsy, when the limbs can be thereby placed in a better mechanical position for locomotion.

Rickets, and its results, especially knock-knee and bow-legs, are carefully treated. The use of apparatus is advised, not only as a preventive means, but as a corrective one. Operative interference is recommended in all the severer grades of cases.

Plastic surgery is only considered as regards the hands and feet.

In flat-foot only the severe grades are recommended for operation.

The chapter on the Functional Affections of the Spine and Limbs is a very suggestive one for neurologists, as well as for orthopædic surgeons, and the benefits of apparatus are well shown.

The eight hundred illustrations, as a rule, are good and well chosen, but the general appearance of type and paper is not as clear as it should have been. The material, however, is so good that the book will take its place at once as the recognized index of progressive American orthopædic surgery.

DE F. W.

THE STUDENTS' SURGERY. By FREDERICK JAMES GANT, F.R.C.S., Senior Surgeon to the Royal Free Hospital. Pp. xxxv., 817. Philadelphia: Lea Brothers & Co., 1890.

THE modest title, and, indeed, the preface of this excellent book, suggest the examination-room and the "quiz," but the work has a larger field. Condensed in form, with small type and meagre space for illustrations, within the more than eight hundred pages is contained a

very large amount of material, which is well arranged, though a good index would greatly add to its availability.

It is gratifying to find a book, intended solely for students, which really contains the essentials of surgery and is not so superficial or so condensed as to be of use only for "cramming," as are so many books of its class. This is an epitome of the author's *Science and Art of Surgery*, exclusive of the chapters on the eye, ear, teeth, skin, female genital organs, and upon orthopædics. It follows the order of arrangement of that well-known work, that one may supplement the other. Simple and straightforward in style, and conservative in tone, the book treats, briefly it may be, but fairly, each of the many phases of its subject. The experience of the writer tells on every page. He has passed the period of operative enthusiasm; with a wholesome regard for the *vis medicatrix naturæ*, operative measures are his last, and not his first resort.

As is the case with most general surgical works now published, the treatment advised is that which had stood the test of time up to ten or fifteen years ago, while the new surgery of to-day is not considered to have won a permanent place. That conservatism seems too great, however, which would justify laparotomy for hæmorrhage in wounds of the abdomen only when "a distinct jetting stream of blood" can be felt by the finger (p. 592).

The author agrees with those who practise venesection for internal hæmorrhage (p. 593). Opium is his sheet-anchor in traumatic peritonitis (p. 596). "Purgatives during the inflammatory stage are useless or injurious." No mention is made of flushing the peritoneum with water, either after fæcal extravasations or in peritonitis.

The preface is dated October, 1889, but parts of the work would appear to have been written some years ago. For instance, the description of the *technique* of antisepsis includes the spray, and refers almost solely to *carbolic acid* solutions. The antiseptic agents "commonly employed" are given as carbolic acid, boracic acid, chloride of zinc, etc., while corrosive sublimate is included among the "others" which "may be mentioned." The fact that the opinions expressed were formed before the reign of corrosive sublimate and well-understood asepsis, is seen also in the discussion of compound fractures and compound dislocations. The present book, though recently published, is really a condensation of the author's older treatise, as has been said.

There is some tendency among writers of the day to make antisepsis the whole of surgery, a mistake of which our author is not guilty. Some harm is done, however, by the publication of really old ideas in a professedly new form, by making the average practitioner, who does but little surgery, contented with results which, according to modern standards, are quite unwarranted.

A valuable chapter is that devoted to the subject of vesical calculus and allied disorders. An excellent description is given of lithotomy in its various forms, and of lithotrity. Safer advice, more intelligent reasoning, or more accurate description could not be desired than is found in the chapters on hernia and intestinal obstruction. The author is not enthusiastic as to the result of the operation for the radical cure of hernia, but believes that it should be undertaken after strangulation, when circumstances permit.

As to the operation of election, he adopts the teaching of Mr. Mitchell

Banks, who writes: "An operation should be recommended (*a*) in children only when it is impossible to get the parents to pay any attention to the complaint—in short, in the children of the poor and ignorant; (*b*) in small femoral herniæ composed of irreducible omentum, always; (*c*) in inguinal herniæ incapable of support by reason of the presence of adherent omentum, always; (*d*) in all herniæ whose great size renders support by a truss impossible." The point in the operation Mr. Banks describes is the complete separation of the sac; the tying it off, if possible, at the level of the abdominal peritoneum; and, finally, cutting it away.

In regard to to the treatment of fracture of the patella, the author says: "Considering the safety and efficacy of the old method, even when apparently resulting in failure, my own judgment decidedly inclines to the treatment of a simple fracture of the patella by bandage-retention of the fragments, in the manner already described; and I think that wiring, if practised at all, should be reserved for those quite exceptional cases in which the fracture remains ununited, as the final result."

The author is earnest in endorsing the time-honored view that simple depressed fractures of the skull should be left alone in the absence of symptoms of compression. "Surgeons," says he, "with unlimited faith in antiseptic precautions, but with limited experience in fractures of the skull, would operate as if the whole significance of head-injuries was the liability to septic infection—even allowing the assurance of its prevention in all cases."

The book is printed in London. It is impossible to avoid disappointment, in these advanced days of wood-engraving, upon finding again the old diagrammatic English style of cuts, which have for so many years served as illustrations. Their usefulness was never great, and the time has come, in America at least, when a much higher standard is expected. Such cuts, for instance, as those on pages 332, 486, 798, 800, 801 and 808, and those in the chapter on hernia, teach nothing, and should have been omitted. G. E. S.

THE PULSE. By W. H. BROADBENT, M.D., Fellow of the Royal College of Physicians, Senior Physician to, and Lecturer on Clinical Medicine in the Medical School of, St. Mary's Hospital, etc. Illustrated with 59 Sphygmographic Tracings. Philadelphia: Lea Brothers & Co., 1890.

THIS little book is largely based on the Croonian Lectures on the Pulse, which were delivered by Dr. Broadbent before the Royal College of Physicians in 1887, and it probably represents the best practical thought on this subject in the English language. Its first chapter opens with a history of our knowledge of the pulse, and this is followed by chapters on the pulse, its production and significance; mode of feeling the pulse; the heart-sounds in relation to the pulse; increased frequency of the pulse; infrequent pulse; intermittent and irregular pulse; the pulse as influenced by variations in arterio-capillary resistance; high arterial tension; the pulse in acute disease, in cardiac valvular disease, in aneurism, in kidney disease, and in affections of the nervous system.

Whilst it is true that the graphic method bears a most intimate rela-

tion to pathological physiology, it is also true that when we endeavor to get a true interpretation of the pulse through the sphygmograph we fail to do it as accurately and as satisfactorily as when we apply the finger. The reason for this defect, which Dr. Broadbent fully recognizes, is not far to seek. The sphygmograph is an instrument which is only capable of registering the undulations of an artery—the rise and fall of a pulsating tube—together with the grosser modifications of these movements. But there is something more than a mere change of form in the pulse-wave which the sphygmograph cannot detect, and it is this defect which, in point of usefulness, will always place it far beneath the touch of the educated finger.

A correct interpretation of the pulse, with its almost infinite modifications brought about by almost unlimited bodily variations, can only be achieved by experience, and as an aid toward attaining this goal nothing will be of more service than this brochure on the study of the pulse.

T. J. M.

LEÇONS DU MARDI À LA SALPÊTRIÈRE. PROFESSOR CHARCOT, Policlinique, 1888–1889. Notes de Cours de MM. Blei, Charcot, Henri Colin, élèves du Service. Tome II. Paris, 1890.

TUESDAY LECTURES AT THE SALPÊTRIÈRE. By PROFESSOR CHARCOT.

THE book before us is a bulky volume of over 550 pages, and embraces a report of twenty-one clinical lectures. It is pleasant to note at once that no attempt has been made, as in a previous publication, at a *fac simile* reproduction of the notes in script, but that the book is printed in clear, bold type. A great variety of subjects have been dealt with, though hysterical disorders largely predominate. The book is full of most interesting material, some of which is new; however, we cannot but regret that the reports were not limited to abstracts and excerpts of the more important matter. In the overburdened condition of medical literature and the great pressure on the time of professional men, it is hardly possible to read long verbatim reports of clinical lectures, in which even the conversations between the patient and the lecturer are repeated with absolute detail and painful accuracy. However, as a mere clinical record, the book is beyond praise.

To give the reader some idea of the subject-matter let us take the *premiere leçon*. Two cases of hysterical yawning, one spontaneous and the other suggested, are first considered. Tracings of the breathing are exhibited, the previous histories and their significance dwelt upon, and the concomitance of other hysterical signs, such as hemianæsthesia, convulsive attacks, etc., pointed out. The third case, one of hysterical rapid breathing, is similarly dealt with. The fourth, and last case of the lecture, is very interesting. It is one of *grand tic convulsif*, in which the tic was associated with coprolalic and psychic disorders. The patient was a man, aged thirty-nine years, who was afflicted with a convulsive movement in which the forearm was suddenly flexed upon the arm followed by a brusque movement of the shoulder. The elbow was then raised to the right side of the face, the head being simultaneously inclined

to the same side. The entire attitude was one of defence, like that of a school-boy about to receive a box on the ears. The tic was so violent and persistent that the patient's wife was in the habit of tying his hands at night to diminish the movements which would otherwise prevent sleep. The attacks came on with the suddenness of electric shocks, and in no way did they resemble the movements in the chorea of Sydenham. With every seizure the patient ejaculated "Ah! Ah!" which the lecturer interpreted as representing, in some sort, the oaths and foul phrases so often observed in other cases. In addition, the patient suffered from psychic disturbance, as illustrated as follows: The patient stated that after writing a letter he would seal and address it, and then go to the post. But when about to place it in the box, he would hesitate, retire four or five times from the opening before finally dropping it, and when the act was at last accomplished he would experience profound emotion. The sight of a razor would fill him with trembling and fear. He had the idea that he would kill some one or kill himself. The sight of a gun, or, in fact, the mere conception of a gun excited the same feeling, and, up to a certain point, he really had the desire to kill some one. Frequently the mere sight of a cabman excited the desire to beat him. Finally, the patient attributed his disorder to the fact that his mother while with child with him had served in the family of a banker who had been afflicted by a frightful tic. This interpretation, however, it is needless to say, was not accepted by the lecturer. The feasibility of exploratory trephining naturally occurs to the reader, but no allusion is made to it. Certainly, in a case the movements of which are so fixed and definite, and in which there can be no doubt about the cortical character of the trouble, the idea of trephining is worthy of consideration.

The other lectures are filled with like interesting material. Much that is unusual and bizarre is presented. A suggestive case, for instance, is that presented in Lecture II., in which a traumatic neuræsthenia and hysteria with hemianæsthesia were imposed upon an old case of sciatica with deformity. The importance and significance of the family history become evident when we are informed that an uncle of the patient was insane, that his mother and father both died of tuberculosis, and that a brother and cousin were epileptic.

A case deserving especial mention is that embodied in Lecture III., of poisoning by carbon disulphide. The patient was a man, sixty-three years of age. He had worked from time to time in the factory when the sulphide was made, at other times he had worked at his trade as mason. For the last four months, however, he had worked steadily at the factory, and one day, while cleaning a vat intended for the sulphide, he met with the following experience:

"It does not seem to be at all rare," says the lecturer, "for accidents of this kind to occur while cleaning these receptacles. This is what happened: all of a sudden, P. (the patient), after having had a feeling of suffocation and a sensation of heat in the scrotum, fell to the ground, without giving vent to the least cry, as though struck by an apoplexy. His companions thought that he was suffocated. They say that during the time that he was unconscious, a period of about half an hour, there were no convulsions. Finally, he came to, and they put him on his feet again very much confused and astonished. He remained in his room for two days, and during this time did not notice especially what was

happening, but on the third day he noticed marked stiffness of the right arm, and on the day following, on awakening he found the limb almost completely paralyzed. On the same day the right leg became affected in the same way, but to a much less extent, for the patient has still been able to walk rather well." The hemiplegia was now of six weeks' duration. In walking the right leg was dragged, the foot now leaving the ground. The arm hung loosely, was not rigid, and was very weak, while the fingers were stiffly extended at right angles to the palm. The last was due to a spasmodic contracture, there being an elastic resistance either to flexion or extension. The mere fact of the position of the fingers not corresponding to the contracture of old organic hemiplegia was enough, the lecturer pointed out, to attract the attention of the connoisseur. Further, there was no exaltation of the reflexes, another anomalous fact. Again, examination disclosed that the cutaneous sensibility of the paralyzed parts was profoundly affected. A profound anæsthesia was found to involve, not only the paralyzed parts, but also one-half of the trunk. A diagnosis of hysteria was made, and the patient's condition compared to that which sometimes results from traumatism, saturnism, alcoholism, etc.

The above extracts will give the reader some idea of these interesting clinics, and would foreshadow the experience of a visit to the Salpêtrière. As already stated, functional diseases and hysteria largely preponderate, though interesting organic cases are not wanting, as witness a case of crossed hemiparaplegia due to lesion of the cord in its lateral half, a result of trauma, and a case of syringomyelia, which is made doubly attractive by being coupled with a case in which hysteria closely emulated the organic disease. F. X. D.

INTERNATIONALER ATLAS SELTENER HAUTKRANKHEITEN. INTERNATIONAL ATLAS OF RARE SKIN DISEASES. ATLAS INTERNATIONAL DES MALADIES RARES DE LA PEAU. Herausgeber-Editors-Editeurs: MALCOLM MORRIS, London; P. G. UNNA, Hamburg; H. LELOIR, Lille; LOUIS A. DUHRING, Philadelphia; L. VOSS, Hamburg. Leipzig: II. (1889, II.)

THIS last issued fasciculus of the *International Atlas of Rare Skin Diseases* is in point of merit quite equal to its predecessor, which has already received a favorable notice in these pages.

The first of the four papers here selected for illustration is by Ernst Schwimmerand, and accompanied by an admirable portrait in colors of a male patient affected with multiple diffuse pigmented sarcoma of the skin. The diagnosis rests upon a careful microscopical examination made of sections of tumors removed from near the brow.

The paper, apart from its intrinsic value, is of interest as establishing further proof of the wide distinction between mycosis fungoides (once thought to be a species of cutaneous sarcoma) and this last-named disease in its several manifestations in the skin. Mycosis fungoides has to-day a scarcely disputed position among the infectious granulomata, and its clinical symptoms are now classically as separate from those of sarcoma as are syphilis and lepra, which the author systematically ex-

cludes from the diagnostic possibilities. It is interesting to note, by the way, that Hardaway, cited by our author among the American contributors to his theme, has lately[1] made a supplemental report of his case of idiopathic pigmented sarcoma, originally described some fifteen or sixteen years ago, in which it is shown that the patient is now in good health, that the active sarcomatous process is apparently at an end, and that the growths are undergoing spontaneous involution, leaving atrophic patches where there were once tumors. The fact is of special interest in this connection, seeing that the strongest resemblance exists between the portraits of the two patients as furnished by the two authors in different hemispheres.

The second of the illustrations in this fasciculus of the *International Atlas* represents the palm of the right hand of a male patient affected with symmetrical erythematous keratodermia, observed some seventeen years ago by Besnier, and then reproduced in one of the fine *moulages* of Baretta. The hyperkeratosic plaques with their reddened rims are well shown in the colors peculiar to each. It is to be regretted that the author did not make it clear in his description whether there was in this case an active or passive hyperæmia of the borders of the patches, and also that he did not state whether there was or was not a coincident hyperidrosis of the hands and feet, and irregularity of the cardiac movements. The later studies of these curious trophoneuroses of the extremities with cutaneous manifestations, make it clear that the redness is often in pure type a passive hyperæmia, and accompanied by profuse diaphoresis, usually limited to the hands and feet. Spontaneous relief of some of these conditions has occurred without the intervention of treatment.

Upon the same sheet with Besnier's case is represented the hand of a young girl under Mibelli's observation, the dorsal surface of the digits chiefly being the seat of multiple verrucous lesions of a dark purplish-red shade. These, microscopically, were discovered to be epithelial growths with a more or less centrally situated cavernous channel of vascular connections, suggesting to the author the name which he has given to the lesions—to wit, angiokeratoma. They are, undoubtedly, very rare, and might be described as warty growths of a blood-vascular type.

Pospelow's case of "ulcus molle mammæ" is the theme of the last paper, and illustrated fully by a life-sized colored lithograph. The ulcer represented might, however, serve as an example of the initial lesion of syphilis upon the nipple, so far as relates to its external appearances. Indeed, attempting to exclude such a possibility by comparing the history of the sore with its portrayed symptoms, one is at once persuaded that it falls into that category of mixed and doubtful cases furnished in every large public, and especially hospital, practice. The author himself seems not to be clear as to all the facts, since he ordered for the patient a mercurial course in consequence of the development later of some suspicious pharyngeal symptoms. On the whole, one would hesitate before citing this as a good example of the exceedingly rare soft chancre of the nipple, whose actual rarity and the cloud that hangs over its few reported cases, lead one to regard with an increasing suspicion the proofs of its existence.

The pages of this fasciculus, albeit they are printed in three languages, betray only a very few lingual errors and typographical faults, so few, in fact, that they may well be overlooked in the results actually

[1] Report to the American Dermatological Association, September 19, 1889.

obtained, after unusual effort, to produce a page for international perusal. The work is highly to be commended, though its usefulness is rather to the expert than to the general practitioner. J. N. H.

THE SUPPRESSION OF CONSUMPTION. By G. W. HAMBLETON, M.D., President of the Polytechnic Physical Development Society of Great Britain. Pp. 37. New York: N. D. C. Hodges, 1890.

THIS brochure, one of the series of *Fact and Theory Papers*, may be regarded as a valuable contribution to preventive medicine. Its author, after giving his reasons for rejecting the prevailing theories of the causation of pulmonary consumption, states that he believes it to be exclusively produced by conditions that tend to reduce the breathing capacity of the lungs, and hence he very strongly advocates pulmonary gymnastics for the purpose of developing the capacity of the respiratory organs, not only as a preventive, but also as a curative, measure in this disease.

It is very obvious that, so far as it goes, Dr. Hambleton's theory abounds with truth, but it is equally evident that it fails to go far enough. If it is true that consumption is solely caused by a reduction of breathing capacity, why is it that the female is a great deal less liable to consumption than the male sex, in spite of the fact that the former has a smaller breathing surface than the latter?

Notwithstanding these and other objections which may be raised against Dr. Hambleton's etiological views, it must be conceded that his mode of suppressing consumption, by enhancing the vital chest capacity, is one of the most efficacious adjuvants in the prevention and treatment of consumption. M.

A NEW MEDICAL DICTIONARY, BASED ON RECENT MEDICAL LITERATURE. By GEORGE M. GOULD, B.A., M.D., Ophthalmic Surgeon to the Philadelphia Hospital; and Clinical Chief, Ophthalmological Department, German Hospital. Philadelphia: P. Blakiston, Son & Co., 1890.

ANYONE who has had occasion during the last eight or ten years to consult a medical dictionary, and who among the readers of recent medical literature but has frequently been obliged to do so, must have been struck with the large number of words which were not contained within its pages. The development of the science of medicine within the last decade, the advances made in microscopy, micro-chemistry, bacteriology and pathology, pharmacology and materia medica, electrotherapeutics and antiseptic surgery, have introduced new terms, which are in constant use, and for the meaning of which the reader has frequently to consult his Greek lexicon and search for the roots from which they are formed.

A new dictionary of medical terms, therefore, was much to be desired, and the present book by Dr. Gould is intended to supply this want.

The author has aimed at giving as much information in as small a space as possible, and has thus made some of his definitions rather too brief—*e. g.*, under the heading "Cæsarean Operation" we find "Sänger's operation, *gastro-hysterotomy*, Sänger having greatly improved the

technique of the operation." "Thomas's operation consists in certain improvements in *gastro-elytrotomy*." As the main features of Kehrer's, Porro's, Sigault's, and the Porro-Müller operations are described in a few words in the same article, we think that a brief description of the essential points of the former operations would have also been in place. We have met with several other instances where the author has, perhaps, been rather sparing of words, but as this is a tendency rarely found among writers of the present day, perhaps it is to be commended rather than condemned. One pleasing feature of the book is that the reader can almost invariably find the definition under the word he looks for, without being referred from one place to another, as is too commonly the case in medical dictionaries. The tables of the bacilli, micrococci, leucomaines, and ptomaines are excellent and contain a large amount of information in a limited space. The anatomical tables are also concise and clear.

We would suggest to the author that, in his next edition, when he makes use of a Greek word, he might insert the accent as is usually customary. A typographical error, which, however, is of little importance, occurs in the excellent appendix on the "Mineral Springs of the United States," by Dr. Judson Daland, of Philadelphia. On page 501 "Fauquier White Sulphur Springs" are said to be in "Fauquier County, Virginia," while on page 479 the same springs are placed in "West Virginia." The former is correct. We would unhesitatingly recommend this dictionary to our readers, feeling sure that it will prove of much value to them. H. M.

How to Examine for Life Insurance. By John M. Keating, M.D., President of the Association of Life Insurance Medical Directors, etc. Philadelphia: 1890.

This unpretentious volume, from the pen of one of our most experienced and conservative life insurance medical directors, is just such a book as the young and inexperienced medical examiner needs. It is not a manual of medical diagnosis, though founded upon the best works of that description. It contains those suggestive hints and recommendations that will be useful to the medical beginner and that can only be furnished by the man of experience.

After an introduction of four chapters filled with advice about "how to examine for life insurance," there are eleven chapters devoted to the special investigation of the different organs of the body as they should be passed in review by the examiner.

The work is not encumbered with detail; only so much has been admitted as may be necessary to fix attention upon essential things. The author has, however, included a description of several of the newer pieces of apparatus that are useful in diagnosis, such as the very convenient ureameter and the saccharometer which are now furnished to the profession. Convenient tables, for reference regarding various physical conditions that admit of tabular statement, have been introduced; and a very useful appendix contains the full text of the "Instructions to Medical Examiners" that have been issued by the principal life insurance companies of this country. H. M. L.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

FRANCIS H. WILLIAMS, M.D.,

ASSISTANT PROFESSOR OF THERAPEUTICS IN HARVARD UNIVERSITY.

Formulæ for Dyspepsia.

Huchard publishes, in *Les Nouveau Remèdes*, April 8, 1890, several formulæ which are claimed to be of value in the treatment of dyspepsia, especially with a view of preventing the development of flatulence. Among the remedies which the author has found most satisfactory, chloroform is the best. On account of its irritant action, it should not be given in a state of purity or in capsules, as is so frequently done, but as chloroform-water.

Saturated chloroform-water	150 parts.
Distilled water	120 "
Mint-water	30 "

Of this mixture a tablespoonful may be taken either immediately before or during a meal.

When it is desired to employ the so-called absorbing powders, the following may be prescribed:

Powdered charcoal	℥ij.
Sodium bicarbonate	℥jss.
Calcined magnesia	℥j.
Powdered columbo	℥ss.

Make forty powders. One powder may be taken half an hour or an hour before eating. If an antiseptic action is desired, at the time of eating:

Beta-naphthol, Salicylate of bismuth, Magnesia	āā gr. xlv.

Make thirty powders, which may be administered as above.

Menthol in the Hyperemesis of Pregnancy.

This is in some cases a grave complication of pregnancy. Copeman's treatment, dilatation of the os and cervix uteri, does not suit every case. Dr. Gottschalk recently described a case where, in a woman aged twenty-six, who had been pregnant three times, uncontrollable vomiting set in during the second month of her fourth pregnancy. Neither cocaine nor Copeman's treatment availed, and the sickness continued until abortion was induced. The patient became pregnant for the fifth time, and the vomiting returned, hæmatemesis taking place. A draught consisting of menthol 1 part, rectified spirits 20 parts, and distilled water 150 parts, was prescribed, and a tablespoonful given every hour. The vomiting ceased after the third dose, and pregnancy proceeded to term without any further complication. A second case was also successfully treated with menthol.—*British Medical Journal*, June 14, 1890.

Pilocarpin in Dryness of the Tongue.

Extreme dryness of the tongue is, under some circumstances, a very distressing symptom, and one which does not readily yield to treatment whilst the concomitant cause remains in operation. The sucking of ice, or sipping of bland fluids gives but temporary and inadequate relief, and the same may be said of glycerin employed as a paint.

In this condition Dr. Blackman has used successfully one-twentieth of a grain of pilocarpin in the form of a gelatin lamel allowed to dissolve on the tongue previously moistened by a sip of water. This dose quickly establishes a moderate flow of saliva, which persists for at least twenty-four hours, and is unaccompanied by excessive perspiration. The altered state of the mouth is often described by the patient as being delightful.

It is scarcely necessary to add that due caution ought to be exercised in the use of so potent a remedy.—*British Medical Journal*, June 14, 1890.

Chlorodyne Poisoning through the Mother's Milk.

A case is reported in the *Australasian Medical Gazette* recently, of a woman who had given birth to twins, and was suckling them both. One evening she took a dose of chlorodyne for the relief of pain, and soon after taking the drug suckled the infants. The children were found the following morning profoundly narcotized, and died before evening.

Excretion of Balsams in the Urine.

The use which is now being made of balsam of Peru in the treatment of tubercular disease has aroused considerable interest in the question as to whether it is apt to produce nephritis during its excretion by the kidneys. Dr. Ralph Stockman has made a number of observations on it and other balsams with the view of determining this. The observations were carried out on two medical men and upon rabbits, and were limited to the four balsams in the British Pharmacopœia, namely, balsam of Peru, balsam of tolu, prepared storax, and benzoin. The result of these observations seems to

show that all these balsams can be given in as large a dose as is ever desired in practice, without any risk of producing albuminuria or nephritis. The amount of irritation which they cause is never sufficient to injure the healthy kidney, although it may irritate seriously one which is already diseased. In some, at least, of the recorded cases of albuminuria, after the administration of balsams, a resinous body in the urine has been mistaken for albumin.—*British Medical Journal*, June 14, 1890.

Acute Œdema Glottidis after Potassium Iodide.

Cases of this nature are few in number, and the one reported by Dr. Groenouw is of practical interest. A strong, healthy man, forty-three years of age, suffering from optic atrophy, and with the urine quite free from albumin and sugar, was treated with iodide of potassium, in the form of a watery solution, in doses of seven to fifteen grains thrice daily. On the afternoon of the second day, when he had taken about forty grains of the salt, he complained of a feeling of rawness in the throat; by the evening of the fourth day there was hoarseness, with pain on swallowing, localized in the right side of the larynx. These symptoms, which were not by any means prominent, were not more pronounced on the evening of the sixth day, after the use of a little over three drachms of iodide. The same night, after two hours' quiet sleep, the patient awoke, began to cough, and noticed suddenly that although the expiration was free, the inspiration was difficult, and he felt as if a valve were in the throat. The difficulty lessened in the space of two hours, and he slept again, the dyspnœa having quite disappeared by next morning. In the afternoon, on examination, the right ventricular band was œdematous, as also the mucous membrane over the arytenoid cartilage and the ary-epiglottic ligament. After an intermission of two days the iodide was resumed; and although the dose was a full one, no further symptoms of iodism appeared. In spite of the severity of the attack tolerance was established. The iodide of potassium given was exactly the same as other patients were using, and it is not likely that the symptoms were due to impurity of the drug.

Groenouw observed a similar case two years ago in a woman of sixty-six, who was the subject of moderately enlarged thyroid, but without difficulty of breathing, and was suffering from oculo-motor palsy of one eye, for which iodide of potassium was prescribed in small doses. After seven grains, severe coryza and conjunctivitis, with great dyspnœa and loss of voice, came on. Examination showed marked pharyngeal catarrh and evident swelling and redness of the ventricular bands. Three days later, when the symptoms had subsided, four grains were given daily for three days; but on being increased to twice daily there appeared—more or less every time—hoarseness, difficulty of swallowing, and pain in the head. The drug was accordingly stopped for four days, and then the patient took about four grains daily, diluted with much water, the dose being gradually increased in the course of the next two weeks to fifteen grains a day. On attaining this amount, it had to be reduced on account of pain in the throat and general restlessness; and seven days later it was discontinued altogether.

Groenouw thinks the following conclusions may be drawn: After the administration of iodide of potassium, there occurs in certain rare cases great

dyspnœa due to œdema of the glottis; sometimes so extreme as to demand rapid tracheotomy. It does not arise from long use or large doses—relatively small amounts have hitherto induced it; and other symptoms of iodism, such as headache, are wanting. The action is local upon the larynx—not a part of a general œdema. Its cause is certainly the iodine, not the potassium, and it cannot be ascribed to any impurity. No local or general diseased state—for instance, cardiac or renal disease—can be recognized; and the cause must be looked for rather in an idiosyncrasy of the individual, although even this is not by any means absolute, as a complete tolerance may be established after a few days' pause.—*Practitioner*, June, 1890.

Bromoform in Pertussis.

Stepp reported a hundred cases of whooping-cough in which bromoform was used with success (*Deutsche med. Wochenschrift*, 1889, Nos. 31, 44), and recently Dr. Neumann has treated sixty-one cases with this drug, or with antipyrin, phenacetin, quinine, resorcin, or benzoin (insufflations). Fifteen of the patients were less than a year old, and a number of the cases were severe in character though there were few serious complications. Bromoform is conveniently administered suspended in sweetened water, half a drop to a drop every two hours to a child two years old.

The intensity and the number of attacks in the twenty-four hours is diminished. The duration of the disease is not shortened, according to Dr. Neumann, though Stepp is of the opinion that this is also a result of its action.

It is harmless, not difficult to administer, and is worthy of a trial, though it is no more a specific than are quinine and antipyrin.—*Therapeutische Monatshefte*, July, 1890.

Dr. Löwenthal, after testing the drug in more than one hundred cases, is more enthusiastic about its results than some others.

It is important to use a preparation which is perfectly clean and has not become discolored through decomposition by exposure to the light.

Children up to one year of age may have 2 to 4 drops three times a day, from two to four years 3 to 4 drops three or four times a day. Up to eight years 4 or 5 drops three or four times a day, according to the number and intensity of the attacks.

The good effects of the drug were apparent sometimes on the second or on the third or fourth day. The course of the disease is shortened, the children being relieved in from two to four weeks. The appetite is improved; in simple cases languor and drowsiness were noticed after each administration of the bromoform. In one case—a weakly child fifteen months old—where too large a dose had probably been given, narcosis ensued. Recovery followed the subcutaneous injection of ether, and camphor administered in powder.

Dr. Löwenthal believes bromoform to be more favorable than any other treatment of pertussis.—*Therapeutische Monatshefte*, July, 1890.

Report of Hyderabad Chloroform Commission.

In the *Lancet* for June 21, 1890, a considerable number of tracings made by the Commission are reproduced, together with the conclusions drawn from

them by Surgeon-Major Lawrie. Chloroform, when given continuously by any means which ensures its free dilution with air, causes a gradual fall in the mean blood pressure, provided the animal's respiration is not impeded in any way, and it continues to breathe quietly without struggling or involuntary holding of the breath. As this fall continues, the animal first becomes insensible, then the respiration gradually ceases, and lastly the heart stops beating.

If the chloroform is less diluted the fall is more rapid, but it is always gradual so long as the other conditions are maintained; and, however concentrated the chloroform may be, it never causes sudden death from stoppage of the heart. So far as experiments on animals go, chloroform has no power of increasing the tendency to either shock or syncope during operations.

The Commission found, however, that struggling during chloroform inhalation, or anything which interfered with the breathing in any way, such as holding the breath or asphyxia, produced irregularities in the circulation and in the action of the heart. Even such slight interference as is brought about by forcibly pulling the tongue forward had this effect. In fact, pulling the tongue was the only proceeding, short of direct irritation of the vagus, that appeared to produce shock. Inhibition of the heart's action and slowing of the circulation, with rapid fall of pressure, caused by irritation of the vagus, proved to be a safeguard rather than a danger.

The Commission found that an effect precisely similar to that caused by electrical stimulation of the vagus is produced through the same nerve—(*a*) in holding the breath, which occurs in the early stages of chloroform administration; (*b*) in asphyxia; (*c*) sometimes after the respiratory centre is paralyzed in the later stages of chloroform poisoning.

The experiments of the Commission proved that death from chloroform is invariably due to an overdose; and the question which next arose was, Are there any circumstances which make chloroform inhalation dangerous, and, as it were, open the door to an overdose, or make the action of the drug appear capricious?

It is fully demonstrated by the experiments of the Commission that struggling, holding the breath, any form of asphyxia, or any kind of interference with the breathing are dangerous in chloroform administration. Obviously either complete asphyxia or continuous holding of the breath, if this were possible, would be sure preventatives of poisoning by chloroform; but the danger in such conditions is due to the fact that they must alternate with extra-vigorous and deep respiration. Struggling makes the inhalation of chloroform dangerous, because it either partially asphyxiates the patient, or alternately does this and accelerates the respiration and circulation, so increasing the amount of chloroform inhaled and hastening the rapidity with which the chloroform is conveyed to the brain and nerve centres. Holding the breath causes asphyxia, and asphyxia produced in this or in any other manner poisons and stimulates the respiratory centre, and, on the one hand, makes it extremely obnoxious to paralysis by chloroform; while, on the other, it leads to gasping and deep inspirations, by which an overdose is very soon taken in. The rapidity of chloroform poisoning when asphyxia is produced is much the same as it would be if you threw a man into a pond, and held a chloroform inhaler over his head every time he came to the surface to

take a breath. This is exactly what a timid or badly-taught operator often does. He measures his chloroform and pours it into a patent inhaler, which he then applies to the patient's face. The patient holds his breath and becomes deadly pale, while his vagus slows the heart and circulation. Presently the patient takes a deep gasp, and as soon as the chest begins to move, the chloroformist thinks there is no danger and replaces the inhaler on his face, probably adding another dose of chloroform as he does so. The patient's natural protective means being exhausted, he very quickly absorbs a fatal dose of chloroform, and we are subsequently told that his heart failed, that he afterwards gasped two or three times and then died. No care in measuring the chloroform or diluting it in a mechanical inhaler is any guide whatever to the amount of the anæsthetic a patient inhales or absorbs. Moreover, breathing through an inhaler is not natural breathing.

The Commission has shown that the key to the safe administration of chloroform is that the breathing be natural, so as to avoid struggling and any form of respiratory embarrassment; and, that it may be so, the anæsthetic must be administered in an open cone or cap, which is held far enough from the patient's face to avoid causing him to hold his breath or struggle, and into which he is at first made to blow after each inspiration, the cap being brought nearer to the face, and eventually quite close to it, as the chloroform begins to take effect and he breathes regularly.

Though fall of pressure is inseparable from chloroform administration, there is never the least danger if it falls regularly, and if the inhalation is stopped directly the state of the cornea shows that the patient is "under." Regularity of the blood pressure depends entirely upon regularity of the respiration. Any irregularity, therefore, in the fall of blood pressure during chloroform inhalation indicates irregularity of or interference with the respiration; and, *per contra*, any irregularity of or interference with the respiration at once causes irregularity in the fall of the blood pressure; but as long as the respiration is regular and not interfered with, the fall of the blood pressure will exactly correspond with it, and will cease long before a dangerous point is reached *if the inhalation is stopped when the cornea becomes insensitive*, or other signs show that the patient is "under." If the respiration is kept up without struggling, holding the breath, or asphyxia, chloroform may be given slowly or quickly, freely and with perfect confidence, without the slightest risk to the patient.

The Commission has demonstrated that the aim of the surgeon must be to give chloroform so that the blood pressure should fall regularly throughout the whole administration, and that the blood pressure can only be kept free from irregularities by absolute regularity of the breathing. The chloroform must, therefore, be inhaled in such a way that the breathing is natural and regular throughout. Feeling the pulse during chloroform inhalation is no guide whatever either to the blood pressure or to the one thing necessary for safety, which is, to keep it regular; and it has been shown above that the pulse is of no value as a sign of approaching danger, since it is only affected dangerously—(*a*) when the respiration has been interfered with, or (*b*) by an overdose. Lastly, in order to keep the breathing regular, the whole of the administrator's attention must be concentrated upon this point alone; and it is therefore clear, that if, as is now recommended in most of the text-books,

part of the chloroformist's attention is to be given to the pulse, an important element of danger comes into the administration.

We can no longer contend, with regard to chloroform, that the results of clinical experience and of experimental research do not agree. The investigations of the Hyderabad Commission have brought to light a strikingly precise and complete agreement between both. In the *Lancet* of April 5, 1890, there is given a continuous series amounting to more than 45,000 cases of almost daily (and often several times a day) chloroform administration, extending from 1847 to 1890, in which the respiration alone was taken as a guide, without one death resulting. We thus see that in a long series of 45,000 cases, extending over forty years, in which the chloroformist's attention was concentrated on the respiration alone, and in which the chloroformists were students, there were no deaths at all; while in another series of 12,368 cases, in which a part of the chloroformist's attention was devoted to the pulse, and in which the chloroformists were specialists (anæsthetists) there were no less than 10 deaths—a fraction over one in every 1250 administrations. These clinical results correspond with the conclusions arrived at by the Hyderabad Commission, and are sufficient to show what a tremendous difference to the patient the mere method of administration may make.

The committee of the British Medical Association on anæsthetics do not agree to all of the conclusions of the Hyderabad Commission (*Lancet*, June 14, 1890). They also found that animals died under chloroform, when its administration was pushed, through paralysis of respiration; and though the heart continued to beat after cessation of respiration, the heart was to some extent simultaneously affected, and there were cases in which the heart appeared to fail at least as soon as, if not before, the breathing. The committee hold that it is quite possible for chloroform to kill by paralyzing the heart. Experiments were made upon rabbits and dogs, where the heart was exposed to view, and any desired vapor could be breathed into the lungs by artificial respiration. When chloroform was administered in this way, there is at once a most serious effect upon the heart; the right ventricle almost immediately begins to distend, the heart presently stops, while the right ventricle is engorged with blood. The contrast is striking when ether is used instead of chloroform, the conditions of the experiment being the same in the two cases. Ether may be given for an indefinite period without interfering with the heart. Unquestionably there may be sudden falls in the blood pressure during chloroform narcosis due to interference with the heart's action.

In practice it makes little difference whether the heart stops before or just after respiration, as those cases in which cardiac and respiratory arrest are almost simultaneous are, for the purposes of the clinician, the same as those in which heart-arrest precedes respiratory paralysis.

The committee think it unwise on the part of the Hyderabad Commission to convey to the public, even through the profession, the notion that the administration of chloroform is a proceeding in which there is practically no danger.

MEDICINE.

UNDER THE CHARGE OF

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A Case of Addison's Disease without Pigmentation.

H. E. Counsell (*Lancet*, 1890, i. 960) reports a case of Addison's disease in a man aged twenty-seven years, of good family history, formerly intemperate, and impotent for two years. He suffered at first with symptoms of gastric indigestion, later growing worse, and attended by feelings of depression. There was progressive loss of weight and strength, shortness of breath, a slight yellow tinge of the skin, vomiting, pain and tenderness in the abdomen, rapid and feeble pulse, dizziness on sitting up, and diminution of the hepatic dulness. Still later the mind became cloudy; vomiting of a blackish material was almost constant, collapse developed, and the patient died. At no time was there any bronzing of the skin.

At the autopsy, one of the supra-renal capsules (the other was probably of the same nature, though this is not directly stated) weighed one and a half drachms, was larger than normal, with bossy surface, and contained in its substance large white deposits, varying in size from that of a pea to that of a cobnut. These masses were almost entirely caseous and did not stain well. No tubercle bacilli could be found in them, though the writer considers them undoubtedly of a tubercular nature.

Contribution to the Pathological Anatomy of Chorea; with the Report of a Case.

Dana (*Brain*, 1890, Spring Number, 71) reports a case of chorea in a youth of eighteen years, who had suffered from the affection for twelve years. He had also had occasional epileptic attacks for several years. He lay in bed unable to walk or help himself on account of the violence of the choreic movements. His expression was dull, and his speech slow and jerky on account of the movements of the lips and tongue. Under the influence of treatment the choreic movements and the hysteroid or epileptic attacks diminished, but the patient died of pneumonia in less than a month after coming under observation.

The autopsy showed nothing of importance wrong on macroscopic examination. Microscopic study, however, revealed a non-adhesive leptomeningitis of the brain, with diffuse and varicose dilatations of the small arteries, especially of the deeper sub-cortical matter and capsule. There were degenerative changes in the arterial walls, and great dilatation of the perivascular spaces. The cortical cells were in most regions normal. The severest changes, vascular, interstitial, and degenerative, were in the under surface of the temporal

lobes, the internal capsule, and adjacent parts of the corpus striatum (especially lenticular nucleus and optic thalamus, antero-internal part). Varicose nerve fibres were here noticed. In the pons and medulla the same condition was observed, though less marked. There was cell degeneration in some of the cranial nerve nuclei, and slight connective tissue increase in the pyramidal tracts.

In the spinal cord there was slight leptomeningitis and congestion of the cord, especially in the lateral tracts. There was also a double central canal in certain portions.

The author has made a careful study of the literature of the subject, and has examined the post-mortem records in over eighty cases; but a critical analysis showed him that there are only thirty-nine of these available for study, as the others were either not instances of subacute or chronic chorea, or no satisfactory account of the lesions of the nervous system is given, or other reasons necessitated their exclusion from the tabulated arrangement which the article contains.

A review of these cases shows that in subacute chorea there is hyperæmia of the brain and parts of the cord. In the brain this is not meningeal but subcortical and basal. The arterial walls are paralyzed, dilated, and badly nourished; exudations occur, and the lymph-spaces become distended and eroded. There are stasis, thrombosis, spots of softening, minute hemorrhages. The lymph-spaces around the ganglion cells are not dilated.

In chronic cases the vascular and neuro-degenerative changes are more marked. The small arteries are permanently dilated, thickened, and degenerated, and the perivascular channels eroded and distended. There is also some connective tissue proliferation, and signs of degeneration in the ganglionic cells. The nerve-fibres show a varicosity. Hyaline bodies are seen. The process is, in fine, first a vaso-motor paralysis and trophic disturbance affecting certain areas of the brain, and, to a less extent, of the cord. Then we have this becoming chronic, with connective tissue hyperplasia, and degenerative changes in ganglionic cells and fibres. The disease cannot be localized in any one spot. It is rather a disease of the intracranial motor tract, including its starting-point in the cortex, and especially in its coördinating adjuncts, the lenticular nucleus and thalamus.

A Case of Raynaud's Disease without Hæmoglobinuria.

Colman and Taylor (*Lancet*, 1890, i. 93, 967) reported a case in a girl, the disease reaching only the ischæmic stage, and affecting usually the two distal segments of the fingers of the right hand. There was a history of a similar condition having affected the maternal grandfather and a great uncle. The attacks were not preceded by any premonitory symptom; the middle finger suddenly became blanched, and the affection then spread rapidly to the other fingers. The thumb was rarely involved. The left hand usually escaped, but when attacked the spasm in both hands was symmetrical. During three of these attacks changes in the blood were observed; viz., crenation and breaking down of the red blood-cells, and coloration of the liquor sanguinis. There was never any pain as the attacks passed off. They were worse in cold weather, but putting the hand in hot water would provoke an

attack just as surely as placing it in ice-water. No hæmoglobin was ever detected in the urine, and it is probable that the small amount set free was excreted by the liver.

Studies on the Bacterial Poisons.

Brieger and Fränkel (*Centralbl. f. d. med. Wissensch.*, 1890, No. 20, 366) have repeated and confirmed the investigations of Roux and Yersin on the poisonous metabolic products of Löffler's diphtheria bacillus. They report the results of their studies on twenty-two cases of pharyngeal and laryngeal diphtheria. From the cultures of the bacilli in peptone-bouillon they obtained an amorphous mass which gave the reactions of an albuminous body approximating to serum albumin. In addition it responded to such reactions as Millon's and the biuret. It was found to be very poisonous, 2½ milligrammes per kilogramme of the body-weight being sufficient to kill, though sometimes only after several weeks. It produced the same symptoms as are seen after inoculation with the living microbes; such as acute inflammation of the kidneys, fatty degeneration of the liver, inflammatory œdema of the part surrounding the point of infection, and, especially, paralysis, particularly of the posterior extremities. The authors were unable to produce pseudo-membrane with the poison, and are therefore inclined to regard this as the specific result of the growth of the bacilli.

They found also a second albuminoid in the diphtheria cultures, closely allied to the first in its chemical properties, but entirely free from poisonous qualities. Only traces of it were found in the virulent cultures, but as the virulence diminished the amount of this albuminoid increased, until it finally replaced the first in the entirely inactive cultures.

In cultures of typhoid and of tetanus bacilli, of cholera bacteria, and of the staphylococcus aureus, as well as in the internal organs of animals dying of anthrax, the authors found substances which had the chemical characteristics of albuminoid, and which were poisonous. For all these poisonous albuminous substances they propose the class name "Toxalbumin."

The Rapid Heart.

After alluding to the perplexities attending this subject, Sansom (*Provincial Med. Record*, 1890, ix. 332) says that he will treat only of that form of disturbance in which the abnormal acceleration of the heart-beat is the chief feature. From this category he excludes those cases in which organic disease of the heart was found to precede the signs of morbid acceleration, or in which the rapidity is associated with such conditions as anæmia, fever, hemorrhage, the action of certain poisons, and the like, which are generally accepted as causes of acceleration. He also excludes the cases due to peripheral irritation, or in which the acceleration is simply paroxysmal, or the condition may be described as palpitation. The definition of palpitation involves a sensation of discomfort or distress accompanying the rapid cardiac action. In the cases which he describes the heart's action is unduly quickened, often for very protracted periods, but there are none of the painful concomitants of palpitation. The average normal rate of the heart-beat may

be taken as 72 per minute in males, and 80 in females. In the erect position these may be raised to 80 and 90 respectively. A rate observed under varying conditions to be over 90 in the adult is morbid. The influence of age must also be considered. The mean pulse-rate of the infant until the age of twelve months varies from 112 to 130 per minute while the child is awake and in a state of quietude. At six years of age the average rate is 100; and at thirteen years, 88.

The classes of cases in which, in adult life, a long-persistent abnormal rapidity of the heart's action has been observed are, for the most part, the following:

1. *Graves's disease.* In this affection there may be either paroxysmal attacks of accelerated pulsations, or the morbidly rapid action may be persistent. There is no doubt that the disease is often fatal, and that the chief cause of danger lies in the cardiac involvement. In fatal cases the heart is constantly found dilated and hypertrophied, but in no considerable degree, and the myocardium has been found in strictly normal condition.

2. *The irritable heart of soldiers.* The author refers to the original observations of DaCosta upon the persistently quick action of the heart found in numbers of the men engaged in the American Civil War. Not only hypertrophy and dilatation, but even valvular defects may probably result from this condition of irritable heart. As Hirsch has shown, there has been a notable increase of heart disease in communities living in great political and social excitement.

3. *Rapid heart in osteo-arthritis.* The author's own observations confirm those of Spender, that with the earliest signs of this affection there is a gradual rise of pulse-rate to 110 or even 120, and that this cardiac tumult does not always subside, even when the osteo-arthritic phenomena disappear.

4. *Rapid heart without notable morbid association.* Cases of this kind have been reported by several observers, in which extreme rapidity of the heart has persisted often for long periods, with little or no subjective sign of distress.

This condition of protractedly rapid heart is undoubtedly dangerous and frequently terminates in death. The views of writers are yet at variance as to whether the affection is one of the myocardium, or one of some portion or portions of the nervous system.

The author then proceeds to a review of seventy-five cases of rapid heart of the nature described, which have been under his observation. He divides these, for convenience, into two classes: First, those in which there was no association whatever with the recognized cardinal signs of Graves's disease. Second, those in which there was such an association, more or less marked. After detailing several interesting cases, he sums up the symptoms seen in forty-six cases of the first class: (*a*) *Circulatory phenomena.* The maximum pulse-rate varied from 90 to 160 in the majority of cases, and in a few instances from 160 to 260. In only three cases were there signs of dilatation of the heart, and murmurs were heard only exceptionally. The pulse-tracings show rather, as a rule, that the arterio-capillary resistance is increased than that there is any of the low tension seen in the rapid pulse of fevers. (*b*) *Sensory phenomena* referred to

circulation or respiration were absent in one-third of the cases, but were present in the others with varying degrees of intensity. Pain about the heart was usually absent or slight. (*c*) The *probable disposing cause* of the onset of symptoms appeared in many cases to be some one of a very great variety of mental or physical overstrain. In other cases the oncome of the symptoms was gradual and associated only with vague dyspepsia. (*d*) Of *associated symptoms* restlessness and insomnia were manifested in a large majority. Among other symptoms occasionally seen were vertigo, tinnitus aurium, marked muscular tremors, mental troubles and aberrations, and exceptionally numbness, severe perspirations, spasmodic asthma, and probably syphilis. Osteo-arthritis was found in six cases, confirming the observations of Spender.

Sansom next takes up the second category of cases, twenty-nine in number, in which the rapid heart was associated with some of the phenomena of Graves's disease; and, after reporting some cases in detail, gives a summary of the symptoms seen in all of them. (*a*) In regard to the *circulatory phenomena*, the maximum pulse-rate varied from 108 to 200; systolic murmurs were present in over half the cases, and in a few instances there were signs of organic disease of the heart. The pulse-tracing showed that the rapid pulse had in some cases the same characters as those described in the first class, while in others it was extremely irregular. The author does not think that this irregularity of the pulse in Graves's disease has been sufficiently brought int. prominence. (*b*) *Palpitation* was complained of by more than half of the patients. (*c*) The *probably disposing causes* were of the same nature as in the first class, though in a number of cases the onset was gradual, and no disposing cause could be assigned. The heart signs were the first to be noticed in the majority of cases. (*d*) Of the *associated symptoms* those on which the author lays the most importance were muscular tremors, defects of hearing, glycosuria, and severe perspirations, though others are mentioned.

Without entering fully into the question of the precise pathology of rapid heart, he thinks the evidence adduced is sufficient to make it in the highest degree probable that the two classes of cases described are closely allied. In both there is present the initiatory influence of psychical or physical overstrain, while in both the condition may develop without any such influence. In both, too, there is ground to believe that organic disease of the heart may be secondary to the nervous implication. He does not think that we should look upon cases of rapid heart as abortive forms of Graves's disease, but rather that the latter is an extended form of the former. The difference seems to be one of the extent of nervous implication rather than of the intensity of it. The signs of more extensive involvement of the nervous system are disturbance of the vaso-motor conditions of the great arteries of the neck; like disturbance in the thyroid arteries; a similar affection of the post-orbital arteries. In the first class of cases—in which cardio-motor conditions were disturbed without local vaso-motor involvements—it is to be noted that murmurs over the great vessels emerging from the heart were far less frequent than in the second class. It seems probable that a disturbed correlation between the heart and arteries was indicated by the existence of these murmurs. Concurrently with any or all of the signs mentioned may be an implication of the motor area, leading to muscular

tremors, and in some cases there may be an impairment of the powers of the mind.

Discussing treatment in a few words, he says that he has found digitalis and heart tonics generally of great value in the milder cases, but useless in severe ones. In these latter the systematic application of the galvanic current in the region of the great nerves of the neck has been very serviceable.

On the Condition of the Left Chambers of the Heart in Mitral Stenosis.

As a result of long-continued study of cases of pure mitral stenosis, Lenhartz (*Wien. med. Presse*, 1890, No. 21, 850) has come to an opinion different from that usually accepted. This latter, namely, is that in mitral stenosis a concentric atrophy of the left ventricle develops, and those cases which do not exhibit this on post-mortem examination are to be regarded as exceptions. The author instanced some examples to show that even in extreme mitral stenosis a moderate filling of the left ventricle is possible through the establishment of compensation. He has had five female patients, suffering from undoubtedly pure mitral stenosis, who were able to walk about and to attend to their housekeeping—a thing which would have been impossible had they had concentric atrophy of the left ventricle. The autopsy made in one of these cases showed that the diagnosis was correct, and that the left ventricle possessed walls of normal thickness.

He has collected 75 cases of mitral stenosis from the reports of the Pathological Institute of Leipzig, and 22 from that of Halle; 61 of the first and 16 of the second were instances of stenosis of high grade, while in 20 cases the stenosis was of moderate degree. Only 7 of the total number of cases exhibited concentric atrophy, in 2 the left ventricle was "comparatively small," while in the remaining cases it was normal or hypertrophied, or in some cases dilated. In 34 instances the stenosis was so extreme that the possibly existing mitral insufficiency could have been of no importance in influencing the condition of the left ventricle, while in 11 of these cases the presence of insufficiency could be absolutely excluded.

From these observations the author draws the conclusion that the provisions for compensation, even in this lesion, are more favorable than usually considered. Factors in the sufficient filling of the left ventricle in this affection are: 1. Strong pressure produced by a hypertrophied right ventricle. 2. Pressure on the part of the auricle. 3. The suction action of the left ventricle, which has been physiologically established.

A further proof of the correctness of these views is found in the often surprising action of digitalis, which reëstablishes the state of compensation. Digitalis acts not only on the left but on the right ventricle. It thus not only increases the power of its contraction at times when it is nearly exhausted, but, by increasing the length of the diastole, allows time for the filling of the left ventricle.

The Significance of Albuminuria.

Goodhart (quoted in *Practitioner*, April, 1890, 302) details his observations upon 272 cases of albuminuria; calling especial attention to the con-

gestive form, in which the patient complains of a certain amount of ill-health, while on inquiry it is found that he eats and drinks too much, takes no exercise, and probably is descended from a gouty ancestry. The urine in some cases is of high specific gravity, and contains only a small amount of albumin. Such cases are clearly not due to nephritis, and the treatment consists in the periodical administration of a purge, and in making the patient conform to the ordinary laws of health. A temporary albuminuria may sometimes be due to the admixture of leucorrhœal, seminal or prostatic discharge.

In cases in which albuminuria follows scarlatina, and is, therefore, presumably due to nephritis, and the patient continues in good health, Goodhart thinks that the phenomenon is to be explained by supposing that each organ has a margin of working power which can be temporarily encroached upon without bad result. He lays down the following as a good rule of practice in cases of albuminuria: If albumin be found in the urine, the case is one for further examination. If it be a young person, and the examination be conducted upon the morning urine, the albumin will probably have disappeared by the next examination, and it is a condition of no importance. If the albumin is in any quantity, and its presence is persistent, or reappearance frequent, it is a danger-signal. He believes that some of these cases, at any rate, are due to patches of inflammation irregularly distributed in the kidneys.

Meningitis and Peritonitis from Pneumococci without Pneumonia.

Debove (*La Tribune Méd.*, May 22, 1890, 333) reports the case of a man of fifty-four years, who presented himself with the symptoms of cerebral excitation, similar to those of alcoholic delirium. The symptoms of peritonitis then developed, and the patient died in three days. The autopsy showed a general purulent peritonitis with a purulent infiltration of the meninges. The other organs were entirely normal. The pus was of creamy consistence, green color, and considerable tenacity—the macroscopic characters of the pus of pneumococci. Bacteriological examination revealed pneumococci in the pus from both localities. The author speaks of the difficulty in determining the etiology of the double localization. It would seem most probable that there was a general infection of the organism by the pneumococci, which had settled in the meninges and peritoneum, but had spared the lungs.

SURGERY.

UNDER THE CHARGE OF

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The Treatment of Goitre by Operation.

This subject is briefly discussed by Berry (*Birmingham Medical Review*, June, 1890). He divides all innocent forms of goitre into two classes;

namely, those in which the whole gland is more or less uniformly enlarged, and those in which the increase in size is dependent on the development of one or more definite cysts or solid tumors, generally in one lobe only of the gland.

The bilateral and uniform enlargement of the whole gland consists in most cases in an increase in the amount of colloid material in the thyroid vesicles. It is practically a hypersecretion of colloid material into all the vesicles of the gland. The enlargement is rarely due to hypertrophy of the solid constituents. It is not dangerous in itself, but may produce death by mechanically interfering with the functions of important organs.

The operative measures adopted for the cure of parenchymatous goitre are:

1. Division of the isthmus with or without removal of a portion of it.

2. Removal of all the goitre except a small piece on each side of the trachea.

3. Extirpation of one-half or more of the gland. Under some circumstances division of the thyroid isthmus is followed by marked relief of dyspnœa and by decided diminution in the size of the tumor.

It relieves dyspnœa not by mechanically allowing the two halves of the goitre to separate, but by draining the gland of its colloid secretion. The relief afforded may be permanent, but frequently the goitre reappears when the wound has healed and the secretion is again pent up in the gland. In many cases attended by urgent dyspnœa the operation does not relieve the dyspnœa quickly enough, and the operator is compelled either to do a tracheotomy, or, what is far better, to remove a considerable portion of the tumor.

For the removal of the greater part of the goitre Mikulicz performs a resection in the following way: One lobe of the goitre is first isolated as though it were to be removed, its attachments on the inner side being untouched, since here the inferior thyroid artery enters and the tumor is in contact with the larynx, trachea, and recurrent laryngeal nerve. In this position a portion of the gland of considerable size is left intact to avoid the supervention of artificial myxœdema. The portion of the tumor on the other side of the neck is treated in the same way. Of twenty-three reported cases of this operation but one perished. The cause of death was recurrent hemorrhage, the ligature having slipped from the superior thyroid artery. Bilateral parenchymatous goitre is sometimes treated by the removal of one lobe. The opposite lobe is, however, prone to become hypertrophied.

In the thyroid hypertrophies affecting one side of the gland, namely, in the so-called unilateral goitres, the enlargement is due in all cases to the development in the gland of one or more distinct tumors, either cysts or adenomatous growths of some kind. Generally parenchymatous hypertrophy distinctly predisposes to this form of cystic or solid growth.

The unilateral goitre may be removed either by enucleation or removal of the tumor from the exterior of the gland, leaving everything else behind, or extirpation, by which the whole of the affected lobe is taken away. Enucleation is of course suited only to those cases in which the goitre forms a well-defined tumor imbedded in the glands. Of 37 cases collected by Keser all recovered.

V. Eiselberg (*Prag. medecin. Woch.*, No. 23, 1890) discusses the question of tetany following extirpation of the thyroid gland, one of the

most common sequelæ of the operation. The subsequent histories of 37 out of the 53 cases of total extirpation of the thyroid gland performed in Billroth's clinic were obtained. Of these 37 cases 13 developed tetany—this disease terminated fatally in 8 cases, in 2 it assumed a chronic form, while the remaining 3 recovered—2 patients developed myxœdema, 2 died immediately after operation, and 19 recovered. Seven of these last, however, suffered from a return of the thyroid tumor. One hundred and fifteen cases of partial resection were in no instance followed by the development of tetany, and this sequel was likewise absent in seven cases of ligature of the arteries.

The development of tetany after operation upon the thyroid is not influenced by wounds of the nerves, by personal idiosyncrasy, by sex, age, or the cause of the wound; it depends entirely upon the effect produced by the total removal of the gland. To further confirm this fact a number of experiments were instituted upon animals. Cats were chosen because they possess no accessory glands. The results observed were as follows:

Total extirpation of the thyroid (33 experiments) gland was invariably followed by tetany, and the appearance of this sequel was not prevented by transplantation of thyroid substance under the skin, in the peritoneal cavity, or between the peritoneum and the abdominal wall, whether such transplantation was made before or after the operation. Injections of the juice of the thyroid gland were also without effect.

In twenty-seven extirpations of one-half of the thyroid, tetany was not observed in a single instance. In four instances hypertrophy of the remaining portion of the gland was observed.

When the thyroid gland was removed by two operations performed at two periods, tetany appeared as soon as the second half was extirpated. In two cases only did it fail to develop. In these the transplanted half first removed was found organized.

Enucleation, with ligature of the vessels supplying the thyroid, was followed by tetany.

In a series of experiments to determine how much of the gland may be safely removed, it was found that if less than one-fifth were left tetany developed.

Subcutaneous Rupture of the Ureter and Ascending Colon.

Chaput (*Bull. et Mém. de la Soc. de Chir. de Paris*, T. xv. p. 202) reports a case which terminated in recovery in spite of a laceration of the colon and rupture of the ureter requiring nephrotomy. The patient was kicked in the right lumbar region by a horse. This injury was followed by severe pain, resembling that characteristic of renal colic, the development of a moderately tender swelling in the lumbar region, vomiting, and constipation. The urine contained no blood and was passed in normal quantity. The administration of a purgative on the fifth day was followed by a movement from the bowels. The swelling in the lumbar region diminished in size. A tumor now formed in the upper portion of the iliac fossa, and was accompanied by the development of a moderate fever. Exploratory puncture of the tumor showed that it contained a turbid, reddish-colored, purulent liquid. In the idea that the

tumor was caused by a suppurating blood extravasation; it was freely incised. This incision opened the peritoneal cavity. A round swelling the size of two fists was found beneath the wound, and was incised. A red-colored fæculent liquid was discharged. It was then found that the swelling consisted of the greatly distended cæcum, the posterior wall of which had been ruptured. By this rupture the bowel communicated with a considerable cavity lying behind the parietal peritoneum. The rupture of the bowel, the incised wound, and the opening into the peritoneum were all sutured. The peritoneum was then stripped forward and inward until the cavity lying posterior to it was exposed. It was found to contain bloody urine. This established the fact of rupture of the ureter. The cavity was drained. A fæcal fistula was subsequently formed. After several weeks the right kidney was extirpated. On examination it was found to be infected with a suppurative nephritis. Not having suitable ligature material, the operator applied two hæmostats to the stump left after removal of the kidney. These were removed the following day. The same evening the patient suffered from a violent hemorrhage. The patient, however, recovered, his fæcal fistula closed spontaneously, and he was discharged well.

A Successful Case of Inguinal Colotomy for Absence of Rectum in a Child Five Days Old.

The importance of examining the anus and rectum for congenital defects before resorting to purgative medicines when the bowels do not operate spontaneously in newly-born children is well illustrated by the following case reported by Helme (*Brit. Med. Journ.*, July 7, 1890).

On superficial examination the child presented all the appearances of perfect formation. The bowels not having been opened in the first two days following birth, castor oil was administered, and the dose was repeated several times in the next three days. Finally, on attempting to give an injection, it was found impossible to force the liquid into the bowel. This led to a careful examination, which showed that the anus was blocked by a mucous septum about half an inch from the skin-surface. From the fact that no bulging could be felt during the child's straining it was evident that the lower end of the rectum was not in contact with the septum. A puncture of the membrane was followed by no escape of intestinal contents. On carefully enlarging the opening and introducing the finger into the peritoneal cavity it was found that the rectum was altogether wanting. Left inguinal colotomy was then performed in the usual way, the bowel being opened at once and evacuated of its contents. The child recovered with an artificial anus.

Successful Laparotomy for the Cure of Intussusception in a Child of Six Months.

The rarity of a successful termination of laparotomy performed for acute intestinal obstruction in very young children induced Ryan (*Australian Med. Journ.*, March 15, 1890) to report the following case. The child, aged six months, had been costive from birth, often going for days without a passage. After a diet of tripe, bacon, and parsley sauce he suffered from

sharp colicky pains. Shortly after, vomiting set in. On examination a sausage-shaped tumor was felt in the left hypochondrium. The abdominal walls were comparatively lax and the tumor could be readily felt. As an additional characteristic sign, a small, slimy, slightly blood-stained motion was passed. No tumor could be felt on introducing the finger into the rectum.

Fourteen and a half hours after the first colicky pains, median laparotomy was performed. After considerable manipulation and the exposure of a good deal of intestine the sausage-shaped tumor was brought to the abdominal incision. The transverse and descending colon were stripped back from the outside of the tumor for some distance and then suddenly the remaining portion of the invagination underwent spontaneous reduction, exposing the ileo-cæcal valve. The abdominal cavity was then irrigated with warm boric lotion and the parietal wound was closed. After the operation a suppository containing gr. $\frac{1}{24}$ of morphia was given. In a few hours the child was allowed to nurse. He was kept quiet by opium, and passed flatus the day following the operation. On the second day the bowels were freely opened spontaneously. Five days later there was a prolapse of small intestine through a portion of the wound which was gaping. The gut was replaced and the wound closed by two silver wire sutures. One of these sutures formed an abscess and was discharged; the other passed into the peritoneal cavity and a month later was passed by the bowel. Since this time the child has been entirely well.

Ryan states that he has performed the operation three times, with but one success; this he attributes mainly to early operative interference.

On the Surgical Treatment of Tuberculosis of the Pleura and Lungs.

Tillmanns (*British Medical Journal*, June 14, 1890) reports an extraordinary case of operative procedure directed to the relief of extensive tubercular disease, involving the entire lung of one side, together with the greater portion of the pleura.

Three years before the patient came under observation six quarts of pus were removed from the left chest by means of puncture. Twice after this thoracotomy was practised, with resection of a piece of rib at the lower posterior portion of the thorax.

When the patient was first seen by Tillmanns he presented the appearance of one in the last stage of phthisis. The left lung was universally infiltrated with tubercles, the pleura being firmly adherent to its upper third. Numerous tubercle bacilli were found in the sputum. The lower two-thirds of the left pleura were filled with pus. Several fistulæ were found in the anterior chest-wall, which was also the seat of disease. The heart was dislocated to the right, lying behind the sternum. The right lung was comparatively healthy and acted well. The patient had been affected with empyema for three years, and during this time had been nearly constantly confined to bed.

In April, 1888, the reporter endeavored to cure the left-sided empyema by means of extensive rib resection. A portion of the thoracic wall was removed measuring in breadth two inches at its upper part and five inches at its lower

part, extending from the second to the sixth rib in front, and involving the seventh, eighth, and ninth ribs behind. On removal of the thoracic wall the whole of the left pleura was found to be tubercular to a high degree. The left lung was phthisical, and no larger than a man's fist, and was firmly adherent at the level of the first rib. The pleura was vigorously scraped with a sharp spoon and the cavity was stuffed with iodoform gauze. The affected lung was partly covered by a pedunculated skin-flap taken from the thorax; this was arranged in such a manner that treatment could still be applied to the diseased organ if this subsequently became necessary. A month later the left pleura was again thoroughly scraped, and was then converted into a cutaneous cavity by transplantations of skin according to Thiersch's method. The left lung steadily diminished in size, and the tubercles of which it was the seat underwent a process of spontaneous cure in consequence of cicatricial contraction.

The subsequent course of this patient has been most gratifying. He attends to business, has gained in weight, and presents the appearance of robust health. The collapsed left lung can be felt in the upper part of the left thorax at the level of the first rib. The right lung is absolutely healthy. The left pleura is a skin cavity the size of a man's fist and is covered with epidermis. On deep inspiration the anterior mediastinum is arched to the left. The movements of the heart can be seen and felt. Tillmanns recommends that in similar severe cases of unilateral tuberculosis of the pleura and lung the same procedure should be adopted. That is, the seat of disease should be exposed sufficiently for local surgical treatment by free resection of the chest-wall in front or behind. In suitable cases a temporary resection may be recommended. A pedunculated section of skin and bone may be turned back; afterward, when the disease of the left lung and pleura is cured, the thoracic flaps can be replaced in their normal position. In the case reported the anterior wall was entirely removed. This would not have been done except that it was extensively involved in the tubercular disease.

This case is particularly important, when it is recalled that Hofmokel, in an article entitled "Clinical Contributions to the Surgery of the Pleura and the Lung," states that all the tubercular cases (twelve in number) treated by surgical intervention perished, and that abstention should be recommended in these cases.

OTOLOGY.

UNDER THE CHARGE OF

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Menthol in the Treatment of Furunculosis of the Auditory Canal.

Cholewa, of Berlin, likens the pathogenic condition of primary furunculosis of the external ear to a culture of microörganisms. He therefore re-

commends the use of a twenty per cent. solution of menthol on a dossil of cotton pushed into the affected ear canal. This application at first causes some burning, which, however, soon disappears. This application may remain in position twenty-four hours, when it may be renewed, this plan being followed out until the cure is effected. If suppuration ensue, the abscess must be opened, and the menthol treatment continued. This treatment is based on the discovery of Koch, that a solution of menthol, 1 : 2000, will destroy the cholera bacillus, while a solution of 1 : 33,000 inhibits the development of the bacillus of splenic fever.

Regeneration and Cicatrization of the Membrana Tympani.

Rumler contributes an interesting article on this subject in the *Archiv für Ohrenheilkunde*, vol. xxx., May, 1890, Parts 1 and 2. His conclusions are as follows:

1. In the closure of a perforation in the drum-membrane, the epithelium of the outer surface takes the initiative, the first manifestations of cell multiplication occurring in the course of six hours.

2. In the course of forty-eight hours the epithelium of the mucous membrane participates in this activity, but does not play an important part at any time.

3. From the third day the growth of connective tissue becomes prominent, and completes the final closure.

4. The membrana propria takes very little, if any, part in the process of healing.

The article is illustrated by several beautiful and explanatory micro-engravings.

Fatal Blow on the Ear.

Heiman, of Warsaw, narrates the case of a young man, twenty-one years old, who, while feeling unwell and weak, received a blow with the hand on the left side of his face. He at once felt vertigo, and ceased work, and it is said that there was bleeding from the ear which lasted two days. He had never had headache, but pus was said to have come sometimes from the left ear. An examination made two days later showed dulness, clouded intellect, difficulty in moving the tongue, vertigo and nausea upon moving; temperature 40.5° C.; pulse 120, quick and small. Dried blood was found on the auricle, and in the auditory canal a moderate quantity of bloody and purulent secretion. The membrana tympani was reddened, and a small perforation was detected in the antero-inferior quadrant. Conduction of sound by the cranial bones was maintained on both sides. There was considerable swelling of the spleen, and tenderness in the ileo-cæcal region. There soon ensued paralysis of the abductors on the left side, dilatation of the pupils, and ptosis, with icterus, tenderness, swelling, and suppuration in the left carpo-radial joint. Unconsciousness and delirium set in, attended with involuntary urination and defecation, and in eight days from the time of receiving the blow, the patient died.

Post-mortem examination revealed pachy-meningitis interna purulenta diffusa; small, numerous sub-arachnoidal extravasations of blood; hyperæmia

of the meninges and brain substance, with lepto-meningitis basilaris circumscripta. A yellowish thrombus was found in the superior longitudinal sinus, and a dark-red one in the transverse sinus and in the internal jugular vein. Chronic middle-ear suppuration, with carious destruction within the mastoid process, and three small openings in the tegmen tympani, were discovered. Furthermore, there were found purulent inflammation of the left carpo-radial joint, incipient exudative purulent pleuritis, metastatic infarct in the lower lobe of the right lung, parenchymatous hepatitis and nephritis; acute swelling of the spleen, and catarrhal enteritis, with very numerous extravasations of blood in the mucous membrane. It is of forensic interest to bear in mind that the fatal result of the disease in this case would have happened very soon even if no blow had been received on the diseased ear. The blow at most could only have hastened the development of the fatal process in the middle ear and temporal bone. (Blair, *Archiv für Ohrenheilkunde*, vol. xxx., May, 1890.)

The Mastoid Process and its Artificial Perforation by Chiselling.

A. Ricord having investigated the description of the mastoid and its cells, as well as the details of the operation of opening this part of the petrous bone, as set forth by classical French writers, corrects the errors which he has found therein, and sets forth the plans he considers best for artificially opening this part of the temporal bone (*Gazette des Hôpitaux*, February 23, 1890; also review of same in *Archiv für Ohrenheilkunde*, Bd. xxx., May, 1890). He concludes that the posterior half of the mastoid is the dangerous part, because of its proximity to the sinus, while the anterior portion is not only less dangerous, but is also the only part which usually contains the cells which communicate with the drum-cavity. He maintains that the mastoid cells, or the petro-mastoid cells as he prefers to call them, are not a special group of cells, but simply an appendix or a prolongation of the cellular structures of the petrous bone. These are always present, whereas the true mastoid cells vary greatly in development, not only in different individuals but in the two bones in the same person. The study of the development of the air-containing structures of the ear shows that in the newborn child they are first formed about the drum-cavity in the petrous bone, and later in the mastoid process. This is demonstrated by twenty engravings.

The artificial opening of the mastoid is then considered. The method advocated by Poinsot was to operate at a point 1–1½ cm. behind the auricle on a level with the upper wall of the auditory canal, while Delaissement advised penetrating the process near its point. Ricord, however, basing his action on his anatomical investigations, recommends operating on the anterior part of the mastoid, like Politzer, Duplay, and others. He makes an incision through the skin on or near the line of attachment of the auricle, and throws the latter forward so as to expose the anterior surface of the mastoid. If the auricular artery is severed in this act, and cannot be ligated alone, the entire thickness of the flap may be caught by forceps and left thus for some hours (Tillaux). He rejects the trepan, but adheres to the hollow chisel. The bone should not be penetrated further than 12–15 mm., so as to

avoid the danger of wounding the facial nerve or the inner ear, especially the semicircular canals.

Sarcoma of the Drum-cavity and the Mastoid Process.

R. Haug, of Munich, reports the following case of sarcoma of the drum-cavity and the mastoid process. (*Archiv für Ohrenheilkunde*, vol. xxx., May, 1890.) The patient, a woman, eighteen years old, states that she had whooping-cough at three years of age. From that time she suffered with otorrhœa of an intermittent character from the left ear. At eight years of age she contracted scarlet fever, when the ear grew worse. The hearing appeared to have been not much affected. Hemorrhages from the ear had never occurred. The beginning of the later aural disease is attributed by the patient to her own action in picking the ear with a hair-pin, immediately after which the ear began to bleed. Soon after a tumor appeared in the inner part of the auditory canal, which was said to be visible to the patient's family, but which was not apparently seen at that time by the physician in attendance. About a week later, however, the physician in charge saw a whitish tumor and removed it with forceps. In four weeks it had grown again, so as to lead to the same method of removal again. In February, 1889, the tumor was removed a third time, in the same way; and in May of the same year, the tumor was operated upon in the same way a fourth time. Each operation was followed by a more intense growth, and the hemorrhages became greater, and the tendency to bleed very marked, hemorrhage being induced by the least irritation of the diseased parts. As long as the growth was limited to the auditory canal the pain was slight, but as soon as it extended outside of the canal the pains increased in intensity. By the beginning of the following May, besides glandular enlargement beneath the lower jaw, a very painful tumor in the mastoid region made its appearance, from which in the course of a few days, after the skin had broken, without suppuration, however, there projected spongy masses of tumor, which bled upon the slightest irritation, and in twelve days had nearly reached the size of a pigeon's egg. Small pieces of the same kind of tumor came from the mouth and nose upon several occasions.

In April, 1889, the hearing in the right ear was normal; in the left, loud noises were heard about one metre. From the left external auditory canal there projected a tumor the size of a walnut, of livid hue, and of soft, spongy consistence, entirely unconnected with the auditory canal or the auricle. There came from it the characteristic odor of necrotic tumor. Two tumors of similar size were behind the auricle in the mastoid region. The mastoid region presented the only part sensitive to pressure. There was some enlargement of the submaxillary glands. The eyelid could be normally closed, and there were no symptoms of facial paralysis. The slightest touch of the tumor produced profuse hemorrhage, for which reason the morbid growth was sprinkled with a powder composed of sabina and alum.

An anæsthetic having been given, the morbid growth was removed as far as possible, by means of a sharp spoon, from the tympanic cavity and the mastoid cells, the latter's pneumatic spaces being found broken down and converted into several large irregular cavities. The hemorrhage, which was con-

siderable, was checked, at least in the antrum, by means of the thermo-cautery, and then all the cavities were packed with iodoform gauze, which checked all further bleeding. There were no meningitic or nervous symptoms, and the patient left the hospital in a few days in good subjective condition. There were no pains, nor any signs of regrowth of the tumor for five weeks. In the sixth week after the operation the tumor began to grow again; two months later had attained a larger growth than ever, and the patient began to emaciate. Facial paralysis now appeared, and three months after the operation the patient died of meningitis. The entire process, from the discovery of the first growth, lasted eleven months.

The Temporal Bone in a Case of so-called Ménière Disease.

Lannois had the opportunity of examining the temporal bones of a patient who died of Bright's disease, and who had previously suffered from the peculiar symptoms of aural vertigo, or so-called Ménière's disease (*Société des Sciences Méd. de Lyon*, November, 1888; *Lyon Medical*, No. 1, January, 1889; *Archiv f. Ohrenheilkunde*, vol. xxx., 1890).

In one of the bones there was a distinct ankylosis of the anterior crus of the stapes, so that its posterior part could sink into the oval window, but not the entire bone. Further, there was ankylosis of the entire chain of bones with one another, and the head of the malleus was adherent to the walls of the drum-cavity by means of fibrous bonds, so that the entire chain of auditory ossicles was held stiff. The microscope revealed a normal cochlea, excepting a small decrease in the nerve-fibrillæ in the lamina spiralis. In the other ear there was a similar change in the stirrup and oval window. The membrane of the round window was hard, dry, and only slightly movable. The labyrinth appeared normal in all its parts. On the strength of these anatomical changes, the author feels justified in concluding that *Ménière symptoms are not always the result of disease of the labyrinth*, a view we have long held and proclaimed.

Foreign Body in the Ear.

Schubert, of Nuremberg, reports a case of foreign body in the ear, unskilfully managed by a physician, which finally terminated fatally from the irritation set up by the rough endeavors to remove it. (*Archiv f. Ohrenheilkunde*, vol. xxx. p. 50, May, 1890.)

A little girl, five and a half years old, was brought to Schubert's clinic with a bean in her right ear, where it had been four days, and which the family physician had tried in vain repeatedly to remove with instruments. There was a copious muco-purulent discharge from the ear, and the auditory canal was swollen, so that the foreign body could be seen with difficulty in the fundus of the ear. As there were grave symptoms, the treatment was limited to antiseptic syringing and antiphlogosis, without touching the foreign body with any instrument. On the fourth day after she was first seen and treated, as stated above, the mother appeared alone, and stated that the child had been attacked with opisthotonos and severe fever, and that she had determined to remove her to their home in another town.

All warnings and persuasions failed to induce the mother to consent to

an operation for the removal of the foreign body from the ear. She removed the child from the aural clinic, and nothing more was heard of the case for some months, when it was learned that the child, after lying six weeks in bed, at last died with abscesses in the left arm and left hemiplegia. The foreign substance was in the right ear.

Perforation of the Membrana Flaccida; Chronic Suppuration of the Attic.

Schubert, of Nuremberg, gives the history of some of these important cases seen and treated by him. (*Archiv für Ohrenheilkunde*, vol. xxx. p. 52, May, 1890.)

With increasing experience the conviction is now firm that the majority of these cases can be cured only by operating on the diseased malleus or other diseased bone tissue in the attic. Within the last five years Schubert has observed nineteen cases of perforation in Schrapnell's membrane (membrana flaccida). The result in four of these is unknown, because the patients withdrew from observation. In all the cases daily injections with delicate curved metallic tubes were made into the diseased space above the short process. Also granulations were sawed off as they appeared. Narrow perforations were enlarged, injections were even made through the Eustachian tube into the drum-cavity. In four cases this could not control the suppuration; in two cases mastoid disease set in; the mastoid process had to be trephined or perforated. In two cases the diseased malleus was excised, *and these were permanently and promptly cured.* In eleven other cases, after many months of painful and exhausting treatment, the purulent cavity became dry, no granulations appeared, and the visible portion of the little cavity appeared cicatrized, or to have a smooth, epithelial surface. In the major part of these cases, however—that is, in six of them—a relapse occurred in from nine months to two years, because there had been no radical cure of the disease, as there would have been by excision. The author is, therefore, entirely opposed to the irrigation treatment so highly prized by Gompertz, among others. Relapses are the rule when an apparent cure is obtained by any other means than excision—an experience common to the aurist of longest practice.

The removal of the carious hammer is in accordance with general surgical principles.

That such an operation does not injure the functions of the ear is shown by some cases detailed by Schubert; in one before the operation the watch was heard 5 cm.; Politzer's acoumeter 1.20 metre; and whispered words ½–1 metre. A week after the operation the watch was heard 10 cm.; the acoumeter 2.50 metre; and whispered numerals 4 metres. In one month after the operation the perforation in the membrana was nearly closed.

In another case, in which there was a detectable caries in the neck of the malleus, the hearing before the operation was 10 cm. for the watch: loud words 1–2 metres. In six weeks after the operation the perforation in the membrana tympani was healed, and all traces of a discharge were gone. The watch was heard 13 cm.; loud words ½–1 metres, some words being heard 2

metres. In two months later, no secretion, loud words 5 metres; whispers 1 metre and plus; many words heard as far as 5 metres.

These are remarkable results in a disease incurable in our experience until we resorted to excision, and invariably attended with profound deafness, very offensive discharge, attacks of pain from blocking of the suppuration back in the attic cavity, and a paramount risk of an extension of the chronic inflammation in the drum-cavity to the meninges of the brain, as long as the carious bonelet is in the tympanic cavity.

Progressive Deafness (Sclerosis) and its Treatment by Tenotomy of the Tensor Tympani.

Cholewa, of Berlin, like Kessel, of Prague, has recently revived this operation, suggested twenty years ago by Weber-Liel, then of Berlin, now of Bonn. (*Archives of Otology*, vol. xix., April–July, 1890.)

While Cholewa was making some tuning-fork experiments last spring, he concluded that "the very best that could be done in those cases of sclerosis of the tympanum with a relatively good bone-conduction" was the above-named operation, for he deemed it probable that this might "improve the function of the intra-tympanic and muscular apparatus for the perception of sound, words, and speech." His subsequent operations in this way have confirmed these views.

In progressive deafness there are two characteristics (Kessel and others), viz.: 1, Great resistance in the mechanical apparatus, "mechanical deafness;" 2, organic alterations in the nervous terminal apparatus, "nervous deafness."

In most cases of sclerosis the bone-conduction of the tuning-fork vibrations is equally reduced in both ears. Active perception in both ears is greater than the bone-conduction.

Cholewa also claims to have first pointed out that in neuropathic sclerosis there is a "pronounced anæsthesia of the membrana tympani," as shown by touching it with a probe, and that the worse ear offers the greater anæsthesia. Also that the better the hearing the less anæsthetic the membrana, and the more the aërial and bone-conduction of sound have suffered, the more marked and the more extensive the anæsthesia of the entire drum-head. "Hence, for the very reason that the objective examination almost always leaves us entirely at sea, this symptom of 'equivalent anæsthesia' is to be highly recommended as one of the chief diagnostic points in the diagnosis of neuropathic sclerosis."

Then follow notes of thirty operations of tenotomy of the tensor tympani, with five failures. The operations of Cholewa, Weber-Liel, and Kessel show that "when the operation was done on the ear that had previously been shown to be the worse of the two (tuning-fork tests), with probable ankylosis of the ossicle, and was of no benefit at all to that ear, nevertheless the hearing of the other ear was decidedly improved."

It is also maintained by the author of the article that tenotomy of the tensor tympani, as asserted by Weber-Liel and Kessel, may be very beneficial in many cases of apparently hopeless deafness. Although the best results are obtained when the chronic catarrh of the middle ear has not advanced too

far, nevertheless it is of use even in advanced cases, as it relieves tinnitus and improves the hearing.

In so-called "neuropathic sclerosis" the operation should be performed when bone- and aërial conduction have not fallen too low. At least one-quarter of the normal duration of perception of the tuning-fork by aërial conduction should be present in a case to be operated upon.

The operation should be done on the worse ear when we have reason to suspect permanent obstructions to conduction to this ear, whilst there are no traces of such change in the better ear.

"If one ear is totally deaf, and the other is growing deaf, the operation is advisable on the latter, on the ground that the reduction of the tension in one side of the muscular apparatus will benefit that of the other."

All that is claimed for tenotomy of the tensor tympani by Cholewa is also claimed by others for excision of the membrana and the malleus, as the latter operation includes the former, and there can be no reunion of the tendon after the removal of the malleus.

DERMATOLOGY.

UNDER THE CHARGE OF

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THERAPEUTIC NOTES.

Compound chrysarobin ointment, used chiefly in psoriasis, is, according to UNNA'S formula (*Monatshefte für prak. Derm.*, Bd. x. No. 1), composed of chrysarobin 5 parts, salicylic acid 2 parts, ichthyol 5 parts, and vaseline 88 parts.

Aristol ointment (*Brit. Journ. of Derm.*, June, 1890) is recommended by EICHOFF: aristol 3 to 10 parts, vaseline 30 parts. It is said to be not less efficacious than chrysarobin in psoriasis, and to have the advantage over the latter that it does not stain the skin or irritate.

Bougard's paste, a powerful escharotic, useful in epithelial cancer, is composed of wheat flour 60, starch 60, arsenic 1, cinnabar 5, sal ammoniac 5, corrosive sublimate 0.50, solution of chloride of zinc 2.45. The first six ingredients are to be separately ground and pulverized, and then mixed together in a glass mortar. The zinc solution is then to be slowly added, while the contents of the mortar are kept rapidly moving by means of a pestle.—*Brit. Journ. of Derm.*, June, 1890.

LASSAR (*Deutsche med. Wochenschr.*, 1890, No. 12) also speaks well of aristol in psoriasis. It acts upon the lesions after the manner of pyrogallic acid and chrysarobin, but without exciting irritation.

BROCQ extols (*Journal of Cutaneous and Genito-urinary Diseases*, July, 1890, p. 266) the cicatrizing properties of aristol, applied in powder, in various ulcerations of the skin, such as syphilitic, scrofulous, and epitheliomatous. Several illustrative cases are reported, more or less in detail. The application has advantages over iodoform in being less irritating, and free from odor.

SAALFELD (*Therap. Monatsh.*, 1890, No. 1) recommends sublimate-vinegar as a convenient and safe remedy for pediculi pubis.

JACKSON (*N. Y. Medical Journal*, Oct. 12, 1889) speaks well of hydroxylamin in the treatment of psoriasis. The remedy does not irritate so much as pyrogallol and chrysarobin; is cheap, leaves no stains, and works as quickly as the older remedies. It is best to begin with weak solutions (1 : 500) and to increase the strength.

IMPETIGO HERPETIFORMIS.

DUMESNIL and MARX (*Archiv für Derm. und Syph.*, 1889, p. 657) report a case of this rare disease, independent of pregnancy, occurring in a woman thirty years of age, the wife of a tailor. The disease consisted in the rapid development of small pustules, pustular from the beginning, and always arranged in groups, the central lesions coalescing and crusting, and new pustules forming on the periphery. The eruption began about the genitalia and gradually spread over the whole body. The mucous membranes were also affected. In the course of the disease, chills, heart-palpitation, vomiting, and nystagmus occurred. Upon excoriated places on the skin, as well as in the mouth, papillary excrescences formed.

AUTOGRAPHISM.

MESNET (*Brit. Journ. of Derm.*, May, 1890) has observed four cases of a peculiar nervous affection of the skin, to which he has given the name of *autographism*. If a blunt-pointed object, like a pencil, be drawn over the skin, there instantly follows a bright, somewhat diffuse red mark, succeeded after a minute or two, by a pale line, which gradually becomes more and more raised above the level of the skin. Elaborate patterns traced on the skin become visible in this way at a distance of over twenty yards. In the cases observed there were all the symptoms of hysteria; in some the skin was anæsthetic. It is not a mere transitory or ephemeral condition, for the cases were observed for a period of ten, eight, six, and two years respectively, and autographism was constantly present. It is evidently a reflex neurosis, and belongs, probably, to the same group as urticaria factitia.

PSOROSPERMS IN PAGET'S DISEASE.

J. HUTCHINSON, JR. (*Lancet*, March 29, 1890), at a meeting of the Pathological Society, showed specimens illustrating the presence in this disease of psorosperms or coccidia. The parasite, of oval or rounded shape, and one-thirtieth of a millimetre in length, was found in the thin layer of the epi-

thelium which covered the affected skin. Each coccidium had a shell which, on section, presented the appearance of a double contour. Often a small knob or aperture at one end, the micropyle, could be distinguished. In the interior, one or more globular masses were to be seen, and sometimes the psorosperms might be observed.

M. Darier, who discovered the parasites in this disease, in 1889, stated that the easiest way of demonstrating them was to scrape the surface, and to treat the scrapings with iodine solution or bichromate of potash. The best method, according to Hutchinson, is to soak the scraped epithelium with liquor potassæ and mount it in glycerine jelly. The parasite appeared to be the same as that infesting the liver or intestines of rabbits and mice. Dr. Crocker has found these psorosperms in abundance in a case of Paget's disease of the scrotum. Dr. Delépine, who had been working at psorospermiæ for six months, had no doubt that the specimens shown were of that nature.

Erythema Scarlatiniforme.

This affection, according to Besnier (*Brit. Journ. of Derm.*, June, 1890), may resemble scarlatina closely. It is febrile for a part or the whole of its course when that is short. There may be shivering, headache, lassitude, and sore-throat at the commencement. The redness begins locally, soon becomes general, and complications, such as albuminuria, may occur. While the rash is at its height the temperature may abate, a point which may help to distinguish it from scarlatina. The other characters which distinguish it are the variable and prolonged period of the eruption, the coexistence of rash and desquamation, non-contagiousness, tendency to relapse, and to occur at certain seasons (spring and autumn), and its causation. This form of erythema, like erythema generally, may be produced by the most varied causes, and yet never lose its identity. Its characters are just the same whether it has been provoked by an external or internal toxic agent, such as mercury, or whether it results from chill, gonorrhœa, or any other cause. There is no specific cause. What will produce it in one person will fail to do so in another, or even in the same person under different circumstances. The effect often continues to persist long after the cause has ceased to exist, and may in duration and intensity be out of all proportion to the nature, energy, duration, or mode of application of the cause.

Erythema scarlatiniforme occurs occasionally (though less frequently than erythema multiforme) in the course of rheumatism, infectious virulent diseases (reactionary stage of cholera), toxæmia, blenorrhagia, syphilis, alcoholism. The cause is frequently external, as in the case of laborers working at high temperature, leather-dressers, etc.; or it may be due to some medicament, of which mercury occupies the first rank. Among the internal toxic agents, mercury again holds the first place, then belladonna, opium, arsenic, quinine, chloral, carbolic acid, iodides, antipyrin, and salicylates.

A Preliminary Treatment of Lupus Vulgaris.

Brooke (*Brit. Journ. of Derm.*, May, 1890) recommends the following ointment as useful for carrying on prolonged treatment in this disease, where

irritation of the skin is not permissible, or in those cases where the well-known heroic measures cannot be practised. The ointment is composed of oleate of mercury (2½ per cent. to 5 per cent.), 1 ounce; salicylic acid, 10 to 15 grains; ichthyol, 15 minims; oil of lavender or oil of citronella, q. s. It is better to begin with the milder ointment and increase gradually. The skin must not be broken by the application. If it becomes sore and threatens to break, the ointment may be weakened with lard. Open sores will often heal under the action of this weakened preparation. The longer the inunction is continued the better—say, twenty minutes at night and ten minutes in the morning. A dusting of starch-powder after the inunction is finished, both keeps the ointment fixed on the skin and takes away the unpleasant sensation of greasiness. Dr. Brooke has employed this treatment for over three years on a large number of patients, with satisfaction. It has been most serviceable in those cases which have never been operated upon. He does not claim that the ointment is invariably successful, nor that it forms in itself a complete method of treating lupus. It involves no pain, and requires no suspension of work or ordinary habits on the part of the patient.

Urticaria in Infancy and Childhood.

T. Colcott Fox in an interesting article on urticaria in infancy and childhood (*Brit. Journ. of Derm.*, May and June, 1890), with special reference to the "lichen urticatus" of Bateman, concludes that this latter affection is certainly an urticaria, and is the urticaria of infancy and childhood. It is characterized by the formation of an inflammatory lesion in the centre of the wheal, the former remaining after the subsidence of the latter; and that the inflammatory lesion is usually papular, but may be vesicular, pustular, or bullous, and that these several phases may be observed in the course of a limited number of cases. This form of urticaria very frequently precedes the operation of vaccination, in many cases follows close upon it, and in rare instances arises in the wake of varicella, measles, or scarlatina, but it bears no direct relation to these diseases. The author is of the opinion that Bateman's lichen urticatus, Hutchinson's varicella-prurigo, the infantile prurigo of other English writers, and many of the papular, vesicular and pustular rashes following vaccination, should be included as phases of one disorder, namely, the urticaria of infancy.

The affection has a very similar etiology to urticaria in the adult, and similar principles of treatment should be carried out, but in the infant the nervous system is more impressionable, the skin more susceptible, and disorder of the gastro-intestinal tract more frequent. Any influences causing irritation to the skin, such as insects or coarse clothing, or any agencies quickening the circulation through the skin, may be factors in promoting the formation of wheals, but such causes cannot be justly ascribed as the origin of urticaria. The affection in all its phases is frequently mistaken for scabies, and some vesicular cases may be confounded with varicella, and a few particular cases with smallpox. Dr. Fox thinks that further prolonged observation is necessary to determine whether this common urticaria ever terminates in Hebra's prurigo (a rare disease in England), or whether the two are wholly distinct diseases.

French Dermatology.

The last meeting of the French Society of Dermatologists and Syphilographists (*Brit. Journ. of Derm.*, May, 1890) brought forth numerous interesting observations, of which the following may be noted:

Hallopeau presented the case of a bullous dermatitis with permanent cicatrices, epidermic cysts, and buccal manifestations, occurring in an infant. The eruption was universal, the blebs, with clear, yellowish purulent, or sanguineous contents, appeared in successive crops, without pain, itching, or febrile reaction. The cicatrices were confluent all over the trunk, the forehead, and the greater part of the extremities. Miliary epidermic nodules of a yellowish-white color, slightly, or not at all raised, appeared in most of the old scars. Vidal, last year, published a somewhat similar case, and Besnier has observed two analogous cases, in which the epidermic cysts developed on the macules following the blebs, but there were no cicatrices.

Mauriac presented a case of hemiatrophy of the tongue of syphlitic origin, being due probably to a central lesion.

Feulard exhibited two cases of lichen planus of different varieties as to the skin, but showing identical lesions on the buccal mucous membranes. According to the author, the cases show the correctness of the view that the different varieties of lichen planus are only forms of one affection.

Fournier presented a case of syphilide of the lower lip resembling lupus erythematosus so closely that it had been treated by scarifications, until the development of a parenchymatous keratitis with iritis called attention to the true nature of the affection, which yielded promptly to antisyphilitic treatment.

Morel-Lavallée read a paper on some difficulties in the diagnosis of syphilitic chancres, *apropos* of a case in which there was no glandular enlargement, and the induration of the initial lesion seemed to develop under the cicatrix.

Hallopeau described an example of local asphyxia of the extremities, with chronic suppurative polydactylitis and ephemeral crops of disseminated symmetrical pustular dermatitis over the body. The general pustulation seemed to be associated with the polydactylitis, possibly depending on the absorption of a ptomaine. The pustules were extremely superficial, drying up in twenty-four hours. They also appeared on the buccal mucous membrane.

Fournier reported ecthyma in a child, simulating syphilitic chancre. The ulcer was situated on the buttock, and its true character perceived only when numerous similar ulcers appeared and healed under simple treatment. Du Castel gave the notes of two cases of atypical syphilitic chancres in which respectively thirteen and seven hard chancres appeared successively within a few days. Mauriac thought such cases not unusual, and Rollet was of the opinion that multiple chancre occurred most frequently on the breast. Fournier had seen a case in which there were twenty-four hard chancres on the two breasts.

A new mode of treating syphilis was described by Quinquand. 1000 grammes of calomel are rubbed up with 300 of castor oil, and mixed with 3000 grammes diachylon plaster. This mass is spread upon linen to yield 14 strips, 3 metres long by 0.20 wide each; a square of 2½ inches contains about

18 grains of calomel. A square of this size is applied in the splenic region and renewed every 8 or 10 days. The elimination of the mercury is noticed in the urine on about the fourth day of the application. The method is clean and efficient, and the author has seen papulo-tubercular syphiloderms resolve in 8 to 15 days.

BARTHÉLEMY records the symptomatic cutaneous eruptions in epidemic influenza, which were observed fourteen times among 219 cases of the disease. The eruption may be described in general as scarlatiniform or morbilliform erythema, disappearing rapidly, as a rule, without desquamation.

ARNOZAN calls attention again to the treatment of epithelioma of the face with acetic acid, which he has employed in eight cases with excellent results. It should be employed in fifty per cent. solutions daily until the crust formed is about to come off; the applications are to be repeated, until finally a cicatrix results.

OBSTETRICS.

UNDER THE CHARGE OF

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ANTISEPSIS IN MIDWIFERY.

LUSK (*Medical News*, May 31, 1890) describes the results of his experience in the practical use of antisepsis in obstetric practice. Up to the year 1875, in New York City, there was a yearly average of $215\frac{5}{10}$ deaths from puerperal sepsis. For the five years from 1885–89, the annual average was 221. The ratio of increase in population was greatly in excess of the ratio of deaths from sepsis. The present aspect of the case may be inferred from the statement that during the past five years one-tenth of the deaths in women between the ages of fifteen and forty-five were due to causes connected with child-birth, and one-twentieth of deaths among women in the child-bearing period were due to puerperal sepsis.

The records of maternity hospitals at the present time fail to show frequent predominance of sepsis. The Emergency Hospital of New York is cited as the simplest and cheapest style of building in which cases of all sorts and in all stages of labor are confined. The mortality rate of this temporary shelter for confinement cases has been greatly reduced by the practical use of antiseptics. For external cleansing, soap and water, and 1 to 1000 bichloride of mercury are employed. For douches, 1 to 5000 solution of bichloride of mercury. For the hands and arms of the operators, bichloride 1 to 1000 is employed. Instruments are cleansed with two per cent. carbolic acid, and are frequently boiled. When intra-uterine douches are needed, they are given of bichloride 1 to 5000. No douches are given as routine treatment without positive indications.

An occlusion dressing is considered of great importance in hospital practice, and is made of some absorbent material saturated with antiseptic solution. In private practice, a healthy patient is not considered capable of auto-infection. A preliminary douche is considered advisable, and one after labor, but none subsequently in uncomplicated cases. Great attention should be paid in private houses to the sanitary conditions of patients. Pads and napkins should be destroyed, not used a second time. The lying-in room should be removed from plumbing connecting with the sewer. As a general statement, the intra-uterine douche is not indicated except where a labor has been carelessly and imperfectly conducted. Lusk prefers a bichloride solution, 1 to 3000, a quart in quantity, injected very slowly, when an intra-uterine douche is needed. Great pains are taken to secure good contractions and the expulsion of all the fluid. An iodoform suppository of two and one-half drachms is inserted in the uterus after the douche. Curetting is admissible if the symptoms of sepsis do not yield to intra-uterine disinfection.

Two Cases of Placenta Prævia.

Elderson (*Medical Press and Circular*, May 21, 1890) reports two cases of placenta prævia in multiparæ, in whom the initial symptom was severe, and constant hæmorrhage, beginning without warning, and occurring during sleep, between the sixth and seventh month of pregnancy. In both, labor was terminated as soon as possible; the third stage was brief, and the patients recovered. In the first case, a delicate woman in her tenth pregnancy, labor ended ten days after the first hæmorrhage, by delivery with forceps. There was no hæmorrhage during or after delivery. Chloroform was administered, and as much of the placenta was separated and removed as could be easily reached by the finger. The second case was caused apparently by agitation due to a hideous dream, the patient imagining that she was attacked by the Whitechapel murderer. She awoke in a fright, in the midst of a severe hæmorrhage. So far as treatment is concerned, the writer has found separation of that portion of the placenta which is accessible by the finger to be the most practical and efficacious procedure. The portion of the placenta remaining connected has been found to be capable of supporting the child's life until labor could be terminated.

Simple Method to Determine the Angle of Pelvic Inclination.

Küstner (*Centralblatt für Gynäkologie*, No. 21, 1890) has found that if the patient be placed upon her back, the chest slightly raised, the thighs strongly flexed, the hands pressed firmly downward, that the promontory of the sacrum can generally be reached through the abdominal wall. A steel ruler is then slipped beneath the finger upon the promontory, its other end lying upon the symphysis. A graded scale attached to the ruler enables one to appreciate the angle of pelvic inclination.

Umbilical Hernia with Malformation of the Liver.

Colla (*Centralblatt für Gynäkologie*, No. 21, 1890) reports the case of a female child born at term, and having an umbilical hernia. It was thought

that the tumor contained intestine, but the free passage of meconium rendered this supposition improbable. Gangrene of the tumor furnished an indication for immediate operation. When the tumor was opened the contents were found to be liver-substance. Visceral and parietal peritoneum which were adherent were separated, and the contents of the tumor returned to the abdominal cavity. The child perished seven hours after operation, and post-mortem examination revealed an abnormally developed liver. The case is of interest for its rarity, and because of the unfavorable prognosis afforded by umbilical hernia when the sack contains liver-substance.

Fibro-myoma and Retroflexion of the Gravid Uterus.

Hooper (*Australian Medical Journal*, No. 4, 1890) reports the case of a primipara in whom labor was delayed by a fibroid tumor. The tumor was extramural, and blocked the entrance to the pelvis, lessening its dimensions three inches. The os uteri was pulled down by a hook, and a Barnes' bag was inserted and filled with water. It was impossible to replace the retroflexed fundus, as the tumor always caught beneath the sacral promontory. During a pause in efforts at delivery the right arm prolapsed. The heart-sounds and movements of the child becoming very weak, it was determined to perform Cæsarean section. Profuse hæmorrhage followed the incision into the uterus. The child was quickly extracted, but gasped but once. The head was firmly wedged into the retroflexed portion of the uterus. The placenta was firmly adherent, and was removed with difficulty. Three fibroids were found, one of them cut through by the incision. The uterus was irrigated with hot water, and closed by continuous suture of kangaroo tendon. Neither omentum nor intestines prolapsed during the operation. It was necessary to remove a wedge-shaped piece of muscular tissue from either side of the uterine incision to enable perfect apposition over the fibroid to be made. Death from exhaustion occurred seventy hours after operation. It is probable that the malposition of the uterus was caused originally by the fibroids, exaggerated by the changes incident to pregnancy.

Hysteria in the Puerperal State.

Broughton (*Boston Medical and Surgical Journal*, June 12, 1890) reports the case of a primipara aged twenty-three, whose marriage had been unhappy. After normal and easy labor, she was subjected to mental annoyances which resulted in fever and delirium. Careful examination failed to reveal an adequate cause for the high temperature, and heart-failure was the only condition threatening the patient's life. Under the use of stimulants and narcotics she improved, and, after periods of depression attended with abdominal distention, finally recovered. Her temperature was uninfluenced by antiseptic medication, and there was an entire absence of anatomical conditions to account for her condition.

Two similar cases are reported by Minot (*Ibid.*), in whom alarming symptoms occurred without the presence of inflammmation. A maniacal condition rendered treatment almost impossible, and both cases recovered gradually, being able to take nourishment freely in spite of severe symptoms.

In discussion upon these cases, GREEN reported four cases in whom the same symptoms had been present, and in whom recovery had finally ensued. In some of the cases, the cause for delusions and hallucinations could be found; in others, such was not the case. In one, the temperature remained subnormal for some time. To these cases PRINCE added another, in whom the rise of temperature followed conversation of an exciting nature a few days prior to delivery. These and other recorded cases prove that all the phenomena of hysteria may occur in the puerperal state, and simulate septic absorption, collapse, and shock following hæmorrhage, and also acute mania.

A CASE OF SPONTANEOUS VERSION.

BENNETT (*Lancet*, June 7, 1890) reports a case of spontaneous version in arm presentation in a primipara aged twenty-six. The presentation was left dorso-anterior. Efforts at version failing, assistance was summoned to perform embryotomy, but during the interval spontaneous version occurred, and the fœtus was expelled in breech-presentation.

FACIAL PARALYSIS FOLLOWING THE USE OF FORCEPS.

RUMBOLL (*Ibid.*) reports the case of a patient with symmetrically contracted pelvis, in whom the forceps was applied at the brim of the pelvis. The child was born with paralysis of the left facial nerve and its branches. The pressure of the forceps, however, was on the side opposite to the paralysis. Recovery followed.

DOUBLE TRANSVERSE POSITION IN TWIN-PREGNANCY WITH PROLAPSE OF THE CORD.

ROESGER (*Centralblatt für Gynäkologie*, No. 22, 1890) reports the case of a multipara to whom he was summoned early in labor. The uterus was greatly distended, palpation gave indefinite results, and auscultation failed to reveal the heart-sounds. The cord had prolapsed, the membranes were protruding, and the pelvis was found on examination to be filled by fœtal limbs. After some difficulty had been experienced in introducing the hand, the first child was turned without rupturing the membranes, and when the feet had been grasped, the membranes were ruptured, and the child delivered. The second child presented again in transverse position, and version was again made, and the child delivered. The placenta was a simple one with double membranes, and was easily removed. The double transverse position is rare, having been estimated as occurring in 0.47 of all twin pregnancies.

PUERPERAL TETANUS.

MARKUS (*Prager medicinische Wochenschrift*, No. 21, 1890) describes the case of a multipara aged thirty-eight, who was delivered of twins after an easy labor, the placenta remaining behind. The patient was taken to a hospital four hours after delivery, and the placenta was expelled. The patient was taken home by her husband three days after confinement, as recovered. Nine days after delivery she was suddenly taken with trismus, and brought

back to the hospital. On examination, the uterus was found just above the symphysis, no tenderness or inflammation about the uterus, and no discharge. Involution had gone on poorly, but otherwise no cause could be found in the pelvic organs for the disease. Albumin was found in the urine on examination. Liquid diet was prescribed, with stimulants as needed. The next day the patient's symptoms grew worse, and death ensued from œdema of the lungs on the evening of the eleventh day after confinement. Post-mortem examination revealed the endometrium in a condition of necrosis; the muscular tissue of the uterus soft, and easily torn apart. In the veins of the right ovarian plexus thrombi had formed, some of which had been separated and carried into the circulation. The spleen was increased one-half, its capsule thickened, and its parenchyma engorged. Inoculation of rabbits with material taken from the subdural spaces of the brain was without result. A diagnosis of necrotic endometritis and septicæmia was made. The cause of the tetanus was thought to have been ptomaines and bacilli formed in the necrotic tissue of the endometrium.

A Case of Syphilis of the Placenta.

Rivet (*Journal de Médecine de Paris*, No. 21, 1890) has observed a case of a woman who became infected with specific infection two years before the birth of her first child. Following this she had a miscarriage at six months, and after this a second child was still-born at the normal period of gestation. The patient's next pregnancy went on to eight months and a half, and she sent for her physician, stating that fœtal movements had become very feeble. On the evening of the same day they ceased to be felt, and the death of the fœtus was diagnosed. Nine days afterward the patient gave birth to a still-born, macerated child. Post-mortem examination of the infant revealed no organic lesions. The placenta presented no macroscopic changes; microscopic examination, however, demonstrated that the placental tissue was friable and broken down, and the arteries of the placenta and cord were in a condition of endarteritis. The diagnosis was made of placental syphilis, and death of the fœtus from impaired circulation caused by specific endarteritis.

Fibroid Tumors of the Uterus Complicating Pregnancy.

Pozzi (*Gazette Médicale de Paris*, No. 21, 1890) gives a summary of the results of treatment from operative procedures in these cases. In general, he finds a maternal mortality of fifty-three per cent. and fœtal mortality of thirty per cent. as the usual result of this complication. An examination of the cases in which simple myomectomy has been done, and the uterus has been left after the operation, reveals a considerable number of cases in which recovery has taken place. Amputation of the uterus gives, on the whole, considerably better results than the more conservative operation.

Dystocia from Closure of the External Os, with Elongation of the Cervical Canal.

Jentzer (*Archive de Tocologie*, No. 5, 1890) reports the case of a woman, aged twenty-two, in labor at term, who gave no history of previous injury or

inflammatory disorder. Labor not proceeding under the care of a midwife, a physician was summoned. On examination, a tumor was found the size of a child's head, projecting between the thighs. Closer examination revealed the fact that it was the head of the child, covered by an elongated and almost impervious cervix uteri. Counter-pressure was made by the midwife in attendance, and the cervix was gradually dilated and the child removed. It had been dead some hours. The patient subsequently made a good recovery, and the most careful examination failed to reveal any history of previous prolapse or disorder such as might cause this complication at labor. An examination of the literature of the subject reveals several similar cases.

Repeated Tubal Pregnancy.

To the list of these cases already reported by Olshausen, Veit, Winckel, and others, Frommel (*Deutsche medicinische Wochenschrift*, No. 23, 1890) adds that of a woman, aged thirty-three, from whom he had removed a tubal gestation upon the right side, ten days after the death of the fœtus. The placenta was removed gradually, and the sac closed by granulation. The patient made a complete recovery, and four years afterward complained of pain in the left side of the abdomen. Eight weeks after the cessation of menstruation the patient collapsed upon the street, with intense pain and symptoms of internal hæmorrhage. The expulsion of decidua followed, and the patient made a tedious recovery. Pelvic hæmatocele occurred, which varied in size, but was finally largely absorbed.

A Case of Metastatic Ophthalmia in the Puerperal State, Caused by Streptococcus Embolism.

Vossius describes very minutely (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xviii. Heft 2) the case of a multipara, aged thirty-nine, who had contracted pelvis. She was delivered after a difficult version of a macerated child. Septic infection occurred, and the patient died six days afterward of pyæmia. The third day after delivery she became blind in one eye, and examination with the ophthalmoscope revealed iritis and general septic ophthalmia. On post-mortem examination, a general pyæmic infection was found, and the eye was removed for microscopic examination. When hardened and cut in sections, the retina was especially affected, the capsule of the lens had ruptured, the lens was dislocated, and the vessels of the eye were filled with masses of streptococci. The sheath of the optic nerve and the blood-vessels about it had escaped invasion, but the other tissues of the eye swarmed with the bacteria; the retina had been one of the first tissues attacked, as was noticed by the early appearance of total blindness. A similar case has been well described by Wagenmann in *Gräfe's Archiv*, Band xxxiii. Heft 2. This is one of the infrequent and interesting complications of puerperal pyæmia.

Two Cases of Extra-uterine Pregnancy Treated by Laparotomy.

Braun-Fernwald (*Archiv für Gynäkologie*, Band xxxvii. Heft 2) reports two cases of extra-uterine pregnancy in which the child was living at the

time of operation. In the first case, after the delivery of the child by laparotomy, the placenta was immediately removed. Severe hæmorrhage followed, and an effort was then made to ligate the vessels which led to the placental site. The patient, however, lost so much blood that death followed shortly after the operation. On post-mortem examination it was found that the blood-vessels supplying the tissues at the placental site, ran from the wall of the uterus parallel with the tube directly to the placental site. In the second case, the sac had ruptured, and the abdomen contained amniotic fluid. The child was at term, living, and lay free in the abdominal cavity. After its removal by laparotomy, the vessels leading to the placenta were ligated before its removal. The uterus was brought up into the abdominal incision, and amputated at the cervix, and the stump was treated by the extra-peritoneal method. The fœtal sac was drained, the child, which was born asphyxiated, was revived, but died subsequently of inspiration pneumonia. The mother made a good recovery. Attention is drawn to the contrast between the two methods of treating the placental site in these cases, and the fact is urged upon operators that it is necessary to ligate the vessels before removing the placenta, rather than after it has been separated from its attachment.

GYNECOLOGY.

UNDER THE CHARGE OF

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Statistics of Ovariotomy.

Terrillon (*Le Mercredi Médical*, July 2, 1890) reports two hundred cases of ovariotomy, with twelve deaths in the first hundred and four in the second, three of the latter being due to shock and only one to sepsis. The writer argues in favor of sparing the remaining ovary when it is not visibly diseased, since nine of the patients thus treated subsequently bore children.

Pregnancy Following Laparo-Myomotomy.

Krönlein showed at a recent meeting of the Versammlung des ärztlichen Centralverein at Zürich a young woman upon whom he had performed laparotomy with extensive resection of the corpus uteri for myofibroma. Contrary to the usual custom he had spared the adnexa. The patient subsequently became pregnant and was delivered after a normal labor.

Electricity as Applied to Gynecology.

Massen (*Journ. acouch. i Jensk. bol.; Gazette de Gynécologie*) reports the results of his experience with Apostoli's method in Slaviansky's clinic. He

introduces a speculum during the *séance*, claiming that he can in this way study the changes in the cervix and the character of the discharge during the passage of the current. He believes that it has a catalytic rather than an electrolytic action, influencing the circulation through the vasomotor nerves. He reports seventy-two cases of fibroid tumor, endometritis and diseases of the adnexa, thirty-four patients having been discharged as positively benefitted, while nineteen were still under treatment. The writer believes that the method of Apostoli, though still empirical, has an assured future, especially as an efficient means of checking uterine hæmorrhage, and should always be given a fair trial before resorting to castration.

Vaginal Hysterectomy.

Ott (*Frauenärzt*, June, 1890) reports eleven cases in which total extirpation was attempted, the operation being abandoned in three cases on account of the extension of the disease to the peri-uterine tissues. All the other eight patients recovered, but six had a recurrence within less than a year.

Vaginal Extirpation of the Uterus.

Malan (*British Gynecological Journal*, May, 1890) believes that the operation should be judged by the results obtained by the best operators. Leopold's statistics show only four deaths in eighty cases, or 5 per cent., and perhaps even this death-rate may be diminished. Forty-two cases had been operated upon more than two years before, of whom twenty-seven, or 64½ per cent., were still free from recurrence. The writer opposes high amputation, first because the mortality is greater [?] than after total extirpation, and secondly, because it is impossible to say beforehand how high the disease extends. Infiltration of the broad ligaments is not in itself a contra-indication to the radical operation, since it may be purely inflammatory and not cancerous. "As long as the uterus can be drawn down, so long is the operation allowable." The condition of the patients with recurrence of the disease after hysterectomy is not materially worse and does not constitute an argument against the operation in suitable cases.

The Surgical Treatment of Cancer of the Uterus.

Petrow's thesis on this subject (abstracted in *Frauenärzt* for June, 1890) is based upon observations made in Lebedew's clinic. The latter performed twelve vaginal hysterectomies with two deaths; two patients had a recurrence within less than a year and only one was free from disease at the end of three years. Of seven patients upon whom high amputation was done, two had a recurrence within eight months, one was healthy at the end of two and one-half years, and four had not reported.

The writer collected from all sources 599 cases of total extirpation and 417 of high amputation, the immediate mortality in the first series being 18.76 per cent., in the second 8.7 per cent. In 21 per cent. of the cases of total extirpation the average freedom from recurrence was only eight months, although the subsequent history of nearly one-third of the patients was not

obtained. Over one-half of the cases of high amputation were lost sight of, but there was a return of the disease in 38 per cent. of the others. From these statistics the writer argues in favor of vaginal hysterectomy. [As the author himself admits, these statistics are unreliable, especially as regards the recurrence after high amputation. There is, however, no question as to the relative mortality following the two operations.]

The Surgical Treatment of Cancer of the Uterus.

Jessett (*British Gynecological Journal*, May, 1890), as the result of his long experience at the Brompton Cancer Hospital, arrives at the following conclusions:

1. When the disease is confined to the portio vaginalis, amputation of the cervix is the operation to be performed, the scissors, rather than the cautery or écraseur, being preferable.
2. Caustics are "unreliable, and, indeed, in many cases, harmful."
3. If the disease does not extend beyond the os internum, conical amputation should be practised; but if it is found to extend higher, the entire uterus may be extirpated.
4. If the disease is limited to the corpus uteri and is recognized early, vaginal hysterectomy is the only operation to be done.
5. "No drugs administered internally have any effect whatever in arresting the disease."

Appended to the paper is a table showing the results in eight cases of high amputation, but both these statistics and those of the writer in vaginal hysterectomy are of little value except as they present the immediate results of both operations, which were good, the mortality being *nil*.

The Limits of Vaginal Hysterectomy for Cancer of the Uterus.

Coe (*Am. Journ. of Obstetrics*, June, 1890), from a study of nineteen cases of vaginal hysterectomy, arrives at the conclusion that when performed in cases of cancer of the cervix the operation can seldom be regarded as a curative one, though the immediate mortality may, in the hands of experienced operators, be reduced to six or eight per cent. He would limit total extirpation to cases of malignant disease of the corpus uteri in which the condition is recognized early, while the uterus is freely movable, the glands and perimetric tissues are not involved, and the patient's general health is such as to offer a fair prospect of recovery from the operation and the enjoyment of several years of life. But even under these circumstances the surgeon may be disappointed by an early recurrence.

The Treatment of Cystitis in Women.

More Madden read a paper before the present International Medical Congress in which he states that no method of treating this affection hitherto employed has secured absolute physiological rest of the bladder. Emmet's operation, of establishing an artificial vesico-vaginal fistula, is open to several objections, though it is successful in some cases. The writer has, for several years, practised the following method: The urethra is first thoroughly

dilated with a specially devised instrument until the sphincter vesicæ is paralyzed, temporary incontinence being produced; glycerite of carbolic acid is then applied directly to the diseased mucosa, pain being prevented by a previous application of cocaine. One or two applications, at intervals of a week or ten days, is sufficient. In any ordinary case of cystitis the cure is rapid.

Vaginal Hysteropexy for the Cure of Retroflexion of the Uterus.

Hartmann (*Annales de Gynécologie et d'Obstétrique*, June, 1890) criticises Schücking's operation for retroflexion as based on an anatomical error—*i. e.*, that there is an actual space between the bladder and the anterior wall of the vagina and uterus, whereas no such separation exists "except in his (Schücking's) imagination." There is not only danger of injuring the bladder, but a loop of intestine might be perforated, while there is danger of infecting the peritoneum if the uterine cavity is not absolutely aseptic. The writer commends the following operation designed by Nicolétis and improved by Richelot, based upon the anatomical fact that at the junction of the cervix and vaginal fornix there is a fibro-muscular ring which has considerable to do with maintaining the uterus in its normal position. High amputation of the cervix is first performed in the usual manner, after separation of the vagina, the wedge-shaped incision being carried up nearly as high as the angle of flexion. The mucous membrane of the uterus is sutured to the posterior edge of the vaginal wound, then a suture is passed through the lateral edge on each side and is carried into the muscular substance of the uterus, emerging at the anterior edge of the raw surface. When the two latter sutures are tightened, the uterus is drawn forward and maintained in a position of anteversion. Additional sutures are employed to completely cover the stump. As the writer admits, this operation is rather to be regarded as a secondary procedure in cases in which hypertrophy of the cervix coexists with retro-deviation, and can only be employed when the uterus is freely movable; moreover, in order that it may be successful it is necessary that the pelvic floor should be intact and that there should be no tendency to prolapse.

Menstruation and the Removal of Both Ovaries.

Engelmann (*Trans. Southern Surgical and Gynecological Association*, 1889) concludes an interesting clinical paper on this subject with the following deductions: The persistence of menstruation after the removal of both ovaries is due to remains of ovarian tissue that have been left, perhaps in an elongated pedicle; such remnants, however, do not necessarily preserve their vitality and functional activity. It follows that menstruation and healthy ovarian activity are inseparable. The surgeon who aims to induce the menopause by extirpating the ovaries cannot expect to accomplish this result with certainty unless every bit of ovarian stroma is removed. In performing double ovariotomy in women who have not passed the climacteric, and do not suffer from uterine reflexes, the operator should spare any healthy ovarian tissue in order that functional activity may be preserved.

Inflammation of the Ovaries.

Slaviansky's most recent paper on chronic oöphoritis (*Annales de Gynécologie et d'Obstétrique*, June, 1890) contains essentially the same views which he has previously expressed. Localized pain is the most prominent symptom; this is not increased by deep pressure in the cirrhotic form of the disease. The pain in these cases may be due to the compression of terminal nerve-fibre by the cicatricial tissue. Hyperæsthesia of the skin supplied by the genito-crural nerve is often noted, especially just before menstruation. The character of the menstrual flow depends upon the amount of ovarian tissue affected; menorrhagia is most common in connection with hyperplastic oöphoritis associated with endometritis. Complete amenorrhœa is comparatively rare. Sterility is a rare result of chronic inflammation of the ovaries; it is most apt to follow that form of acute parenchymatous oöphoritis which accompanies certain febrile diseases. Among the reflex neuralgias, pains in the sixth and seventh pairs of intercostal nerves, on the side corresponding to the affected ovary, are quite common. Migraine, palpitation, reflex cough, and gastric irritability are well-recognized phenomena. Contrary to the usual view, hysteria is very rare in patients with chronic oöphoritis.

The writer has considerable faith in medication, especially in iodide of potassium, which he uses in the form of vaginal suppositories. Hot douches and pelvic massage are useful, especially the latter. Menorrhagia should be treated by curetting the endometrium, an operation which not only does not affect injuriously the diseased ovary, but often causes an improvement in its condition. Intra-uterine galvanization is equally efficient as a hæmostatic. Oöphorectomy is to be considered only after all other means of relief have been faithfully tried. The writer is opposed to an early resort to the operation, having frequently observed cases in which patients who had been told that there was no relief for them except by laparotomy, were cured without it.

Cystopexy.

Under this term Tuffier (*Le Mercerdi Médical*, July 2, 1890) describes an ingenious operation for the cure of cystocele which is based upon the same principle as the Alexander-Adams operation. He first experimented upon dogs, opening the abdomen, denuding corresponding surfaces on the anterior wall of the bladder and the abdominal wall, and uniting them by sutures. Union readily took place, without causing vesical irritability by reason of traction on the neck of the bladder or ureters. No diminution in the capacity of the organ was noted in consequence of the necessary change in its shape; its adhesion did not prevent it from distending sufficiently. The lateral ligaments of the bladder in the human subject being too slight to afford any support, it occurred to him that this might be obtained by shortening the urachus, which was practised successfully in the cadaver. He had performed the operation twice on the living.

The details in the second case were as follows: Under strict antiseptic precautions an incision was made, as in suprapubic cystotomy. The peritoneum was stripped from the lateral walls of the bladder until the vagina was reached; this procedure was facilitated by pushing up the vagina from below.

In order to avoid the ureters, a point was then selected on each side an inch above the vaginal fornix. On making upward traction upon the bladder at these points the cystocele was completely reduced. The organ was then fixed in its new position by passing four silk sutures on each side through the wall of the bladder and the raw surface on the anterior abdominal wall. After closing the incision, the vagina was tamponed with iodoform gauze, and the urine was withdrawn by catheter for a week, the tampon being renewed at intervals for two weeks, when the patient was allowed to leave her bed. One patient has been under observation for a year and a half without having a recurrence of the cystocele.

PÆDIATRICS.

UNDER THE CHARGE OF

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Treatment of Croupo-diphtheritic Laryngeal Stenosis by Intubation.

Ganghofner (*Jahrb. f. Kinderh.*, xxx. 3, and *Med. Monats.*). During a period of eight months 105 cases of diphtheritic stenosis came under the author's observation. Of these, 18 recovered spontaneously. Of the remaining 87, in 42 intubation was performed, and in 45 primary tracheotomy. Of those who were intubated 17 were under two and a half years of age, 19 under four, 4 under six, and 2 over six. Of 41 cases in which the result was known, there was recovery in 8. Of the 45 in which tracheotomy was performed, the youngest was eleven months old, the oldest eight years. Only 4 of the 45 recovered. Of the 42 cases of intubation, tracheotomy was subsequently required in 21, and death ensued in all. It is evident that intubation had nothing to do with the high mortality in this series of cases, but that the character of the epidemic was very destructive. The combination of the cases of intubation of Guyer, Ranke, and Ganghofner, 112 in all, showed 31 recoveries, that is, 27.6 per cent. The statistics of Dillon Brown show 27.3 per cent. of recoveries. It is, therefore, concluded that intubation deserves full recognition, as compared with tracheotomy, and its further trial on a very large scale is justifiable. Especially does this remark apply to the diphtheria wards of hospitals.

Multiple Abscesses in Nursing-infants.

Couder (*Le Concours*, April 12, 1890). It is not always easy to determine the cause of multiple abscesses in very young infants. In many cases tuberculosis is the cause. In others, there is gradual inoculation of pus from a pri-

mary eczematous accumulation. Certain cases may be attributable to puerperal pyæmia, in which the umbilical wound is the seat of entrance. In others, according to Budin, there is no erosion of the external covering, and pyogenic microbes probably enter by way of the mother or nurse, who may be suffering from inflammation of the galactophorous ducts. Galactophoritis should, therefore, be considered in the course of an examination, and if it is found lactation should be suspended, for milk which is charged with pyogenic microbes as it traverses the excretory canals will communicate pyæmia to the infant.

A Case of Multiple Tubercular Tumors in the Brain of a Child aged Seven and a half Months.

Henoch states that among fourteen of his cases "there were twelve between nine months and two years of age," and he points out that "the assertion of Rilliet and Barthez that this disease is never observed before the third year, is to be explained by the circumstance that these authors only saw children over two years of age in their hospital." Ashby and Wright, in their section on tumors of the brain, write as follows: "No age is exempt; tubercular tumors have been found in infants a few months old, though they are more common somewhat later." Eustace Smith, referring to the opinion already noted that cerebral tuberculosis is rare under two years of age, states his belief that "the occurrence of the disease in infants is more common than has been supposed;" and he supports his opinion by recording two cases in which tubercular tumors were found post-mortem, at the ages of twelve and six months respectively. Baginsky, while acknowledging that the rule is to find the disease during childhood, refers to three of his own cases, in which the ages were seven, eleven, and eighteen months respectively, the two latter having been verified by post-mortem examination. Steffen, of Stettin, in discussing the age at which cerebral tumor is likely to occur, remarks that during the first year of life the number of cases is generally small, and confined, with the exception of a few cases of sarcoma, to tubercle. Most writers on cerebral tuberculosis make mention of the remarkable case recorded by Demme, in which a tumor the size of a hazel-nut was found in the brain of an infant aged twenty-three days, whose mother suffered from tuberculosis. In this case the disease must have commenced during intra-uterine life.

J. McN. was born, of healthy parents, on March 26, 1889, and was to all appearances a perfectly healthy child. She became plump and strong, and continued to thrive until she was about five months old. About this time she was pitched out of her cradle by an older child and fell on her head, but her mother declares that it was not a severe fall, nor did she cry much in consequence. Three weeks later it was observed that there was something wrong with the child; she seemed dull, heavy, and listless. The right side of her face was quite expressionless. There was occasional nystagmus and squinting. The right pupil was distinctly smaller than the left, but contracted equally with the other on exposure to light. For several days previously she had been observed to put her hand to her right ear, and was inclined to rub that side of her head against the shoulder of anyone who held her. For some days

afterward she remained in very much the same condition, only that she seemed to suffer more pain than before, especially in the neighborhood of the right ear. As the pain increased daily, and as the membrana tympani was very red and inflamed, the drum was punctured, but nothing save a few drops of blood came. The puncture appeared to give some relief, however, but only temporarily; the child did not cry so constantly or so piteously as before. About this time paralysis of the orbicularis came on, so that the right eye remained permanently open. The left arm and left leg would at one time hang quite limp and apparently paralyzed, and at another become rigid. The anterior fontanelle was slightly depressed at first, but latterly the depression became very marked.

Death took place on November 9, 1889.

Post-mortem Examination.—The body was much wasted, and presented the usual appearances of infantile atrophy. The dura mater was firmly adherent to the internal surface of the calvarium. The cerebral tissue was somewhat soft, and the surface of the convolutions was rather intensely injected. On removing the brain, it was found to be the seat of multiple caseous formations, which, in some instances, had broken down into a greenish granular semifluid material. The tubercular nodules, which varied in size from a small pea to a large hazel-nut, were found chiefly in the following situations: 1. In the pons Varolii two nodules, one on either side of the middle line, that on the right side being the larger of the two. 2. A nodule about the size of a split pea in the left lobe of the cerebellum on its under surface. 3. A nodule the size of a hazel-nut in the upper and anterior portion of the cerebellum, where it formed the anterior extremity of the roof of the fourth ventricle. 4. Nodules, each not less in size than hazel-nuts, were also found in the left optic thalamus, and in the floor of the fourth ventricle. Several very small nodules were also found in different parts of the cerebrum, there being no fewer than six tumors of considerable dimensions, as detailed above. The lateral ventricles were much distended, and contained a large quantity of clear fluid, which escaped during removal of the brain. The membranes and vessels at the base of the brain were normal. The lungs, with the exception of one point at the junction of the upper and middle lobes of the right, were quite non-adherent. At this point, however, a caseous ragged cavity, capable of holding a small walnut, was opened into. The lungs generally were beset with small, opaque, hard, caseous tubercles, which were easily felt projecting through the pleural surface, and which presented all the characters of chronic miliary tuberculosis. The lymphatic glands surrounding the bifurcation of the trachea were found to be much enlarged and extensively caseous. Some of them were very intimately related to the walls of the great veins of the region. Under the microscope the usual appearances of caseous tubercle were discovered, with here and there traces of commencing calcareous infiltration. The heart presented a normal appearance. The liver, kidneys, and spleen, on being removed from the body, were found to have healthy naked-eye characters. On microscopic examination, however, a few miliary tubercles were found in the kidneys, and the liver was seen to be the seat of a moderate fatty infiltration.

In the fresh state, a scraping from one of the caseous nodules in the lungs was subjected to the Ziehl-Neelsen method, and, on examining the specimen,

large numbers of tubercle bacilli were found. After careful hardening in alcohol, microscopic sections of one of the nodules in the pons Varolii were likewise subjected to the Ziehl-Neelsen method. On examining a number of the sections so treated the tissue was found to be teeming with most typical tubercle bacilli.

In a child predisposed to tuberculosis (in that state of constitution favorable to the reception and growth of tubercle bacilli) the fall may have caused punctiform lacerations or bruises of the cerebral tissue, in which bacilli, carried by the blood, might settle and thrive, owing to the diminished resisting power of the injured parts.

In the present case there were localizing symptoms, although no doubt they were somewhat confusing, and so the case is an exception to what Henoch believes to be the rule, namely, that multiple tubercle is far more subject to latency than the solitary form.

The bronchial glands were the seat of advanced tubercular disease, and it is extremely probable that here we have the starting-point of the whole series of tubercular changes found in the case. Under these circumstances we are justified in concluding that the accident of a fall upon the head, which the child sustained, determined the development of the tubercular tumors in the brain; and that in a large number of cases of cerebral tubercle, a similar succession of events will be found. Support is given to this opinion by an examination of thirteen cases recorded by Henoch. In eight of these thirteen cases there were well-marked tubercular changes in other organs besides the brain, and in four of the eight cases the bronchial glands are described as caseous. In five out of the thirteen cases the condition of other organs as regards tubercle is not mentioned, although it does not of necessity follow from this that the tubercle was solely confined to the brain. From a nosological point of view it follows, therefore, that in a considerable number of cases cerebral tubercle cannot be classified as a primary disease of the brain, and that its clinical significance is entirely subordinate to that of the general tubercular state.—*British Medical Journal*, May 31, 1890.

PUBLIC HEALTH.

UNDER THE CHARGE OF

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The Italian Public Health Act, 1888.

On December 22, 1888, the "Legge per la tutela della igiene e della sanità pubblica" received the royal assent, and since the first day of the present year its provisions have come into full operation, so far as existing circumstances permit. Europe, indeed the entire civilized world, will watch with

interest the results and practical working of a law which is a masterpiece of comprehensive and scientific legislation, worthy of the sons of forefathers whose jurisprudence was the foundation of the civil law, and is still studied by the jurists of every country.

Like all Italian statute laws, the Act itself is remarkably concise, dealing with principles rather than details, these being provided for in a supplementary "royal decree," or, as we should say, an "order in council." The Act is, therefore, an outline, the details of which may be to a great extent modified from time to time, as experience or circumstances may suggest, without the repeal of a single clause, and without the cost and confusion inseparable from subsequent "amendment acts."

The provisions of the bill having been carefully considered by the ministers, and in a select committee of Parliament, as well as by the Royal Society of Hygiene, in their annual congress at Bologna, and passed with no material alterations by the Senate, Signor Crispi, unwilling to imperil its passage through the lower house during the current session, resolutely refused to admit of further amendments, insisting on its acceptance or rejection *in toto*. That it passed by an overwhelming majority will not surprise those who know the absence of factious opposition and of obstruction, on purely party grounds, that marks the reception of measures of a non-political character in the Italian Parliament.

Two ideas, which British legislators have hitherto entirely failed to grasp, pervade the whole scheme. First, that important as sanitation undoubtedly is, it is not all that is implied in the care of the public health, but that medical relief of the poor, diseases of domestic animals, water supply, and the adulteration of food, etc., the hygienic aspects of industrial, manufacturing, and agricultural operations, the drainage of lands and conservancy of rivers, the health of the army, navy, and mercantile marine, provision for burials, the registration of births, deaths, and marriages, and the regulation of the medical, pharmaceutical, and allied professions, with other matters usually dealt with by separate acts and authorities, are but parts, coördinate and mutually connected, of one great department of social legislation and economy.

Secondly, that these demand special knowledge, not only in the executive or officials of the sanitary service, but not less so in the administrative, and that, consequently, the control of the public health cannot safely be entrusted to boards elected by popular suffrage, on other issues than those of special competency; in other words, that the sanitary councils or boards of health must be distinct from the local authorities, be composed exclusively of experts in the several branches of the work, and be appointed by an independent authority—*i. e.*, directly or indirectly by the Crown, so as to be themselves uninfluenced by the fear or favor of the ratepayers, and of the public over whose interests they have to watch.

The main characteristics of the Act are, therefore, the recognition of the wide scope and mutual bearings of the questions involved, and of the necessity of both scientific acquirements and independence, alike in the administrative and the executive departments; and the happy balance maintained between the rival claims of local self-government and of control by the central authority, with a corresponding apportionment of the fiscal burdens.

The administration of the law devolves on the Minister of the Interior,

the prefects and sub-prefects of the provinces, and the syndics of towns and communes, the latter officials being elective, and the former appointed by the Crown. The provinces, sixty-nine in number, have populations varying between 100,000 and 1,200,000, corresponding thus to English counties. The Minister is advised by a Superior Board of Health, the members of which are appointed for life, and debarred from private professional practice. The prefects in like manner by provincial boards, the members being appointed by the Crown, for periods of three years, but eligible for reappointment, and permitted to engage in practice, receiving fees for attendance at the meetings.

The boards, superior and provincial, are composed exclusively of experts, the provincial of two to four physicians and one to three engineers, with a chemist, a pharmacist, a veterinary surgeon, a lawyer, and one member conversant with administrative business; the Superior Board is constituted in like manner, though somewhat more numerous, and has a number of *ex-officio* members, representing the several departments of the State and the public services concerned in the administration of the Act.

In each province is a "provincial medical officer," appointed for life by the Crown on the recommendation of the Superior Council, with one or more divisional officers in the largest provinces, and others in the chief cities of the kingdom. One-sixth of these appointments have, in the first instance, been conferred on eminent hygienists, but, for the rest, competitive examination is required, in addition to certificates of having passed with credit a course of instruction in hygiene and laboratory work. These officers are divided into three classes, and promoted by merit as well as seniority. There is also a provincial veterinary officer or inspector, on whom devolves the systematic supervision of all dairy and grazing farms, horses and cattle, slaughter-houses, and places for the sale of meat or milk, in which duties he is assisted by local inspectors. He takes cognizance of the health and sanitary surroundings of the animals themselves, while in England it must be shown that the stall or stye is a nuisance to other persons than the owners, or that the animal is at the time on sale for human food.

In each commune a medical man, practising and residing in the district, is selected on the ground of competence by the provincial board to act as health officer of the commune. These appointments are open to revision every three years, and cannot be conferred, except provisionally, on men who have not undergone a course of practical instruction in hygiene. The powers of the communal medical officers are limited to advising the local authorities, and furnishing information to the provincial medical officer.

The law on the sale of adulterated or damaged food, drugs, etc., including, as in Germany, Austria, Denmark, and Sweden, the use of poisonous materials in wall-papers, toys, and all articles of domestic use, of which the English law takes no cognizance, is very, though not too severe. The entire stock of the article impugned is confiscated, and a second conviction involves imprisonment as well as fine. Instead, too, of our haphazard way of trying to catch the petty dealer unawares, the medical officer may at any time deliberately inspect the whole stock in such shops and manufactories, with, if he wish, the assistance of a chemist. As regards pharmaceutical establishments, this inspection is obligatory at least once a year.

No one is allowed to practise as a medical man, dentist, veterinary surgeon, midwife, or pharmacist, unless holding a legally recognized diploma, while medical practice and pharmacy are absolutely dissociated. Under no circumstances whatever may a medical man dispense; and this is not felt as a hardship, for the profession itself insisted on the withdrawal of a saving clause in favor of men practising in rural districts, for which one had to be substituted permitting the local authorities where, and *and so long only* as there should be no pharmacy within a practical distance, to provide their medical officer with drugs for the exclusive use of his pauper patients. On the other hand, the pharmacist, while enjoying his legitimate monopoly, incurs the heaviest penalties by exceeding or abusing his privileges. Excepting a certain number of officinal and other preparations specially scheduled by the Council, the pharmacist must not supply any remedies in a condition, or with directions for internal or external use, without the written order of a medical practitioner. Proprietary medicines, unless their composition be known and approved by the Council, are thus *de facto* illegal.

Notification of infectious diseases is compulsory, the certificate being sent, with remarks as to the sanitary surroundings, or probable source of the infection, to the Provincial Medical Officer; and all certificates of the cause of death are forwarded by the medical attendant to the Syndic, not given to the friends.

There are many other provisions in the Act well worthy of imitation, apart from the completeness and harmony of the entire scheme; and to those who may be inclined to object that the code is Utopian, and that it is inexpedient if not dangerous to legislate in advance of public opinion, the best answer is that which Prof. Ruata gave to an eminent statesman in connection with this very question:

"A well-conceived law may impart a greater impulse to public opinion in the course of two or three years, than it would have received from the spontaneous progress of enlightenment in a whole generation."

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